THE IRON AGE

New York, February 21, 1924

ESTABLISHED 1855 VOL. 113, No. 8

Powdered Coal for Locomotive Shop

Distributed to Sub-Stations and Thence to Individual Furnaces—Special Design Necessary for Forge Furnace Temperatures

BY CHARLES LONGENECKER

A FACTOR of paramount importance, especially to large manufacturers, is the necessity for providing for an adequate and dependable fuel supply at all times. The price and supply of oil and coal have fluctuated widely in the past few years and, while today these commodities are plentiful, their future status is uncertain. With this in mind the foresighted manufacturer will make every provision to fortify himself against possible shortage. A step in this direction has been taken by the Baldwin Locomotive Works at the Eddystone plant, where practically all furnaces have been equipped to burn either fuel oil or powdered coal.

Located 12 miles from Philadelphia, the Eddystone plant covers an area of 585 acres. Since the first building was erected, in 1906, the number of shops has been steadily increased until today the plant is probably surpassed by none in up-to-date methods and in superiority of workmanship. Here all types of locomotives are built, from the smallest narrow-gage

Interior of Main Station, Showing Rotary Drying Cylinder in Center, with Two 25-Ton Pulverized Coal Storage Bins in the Rear. The vertical cylinder in left foreground is one of the ejectors by which pulverized coal is sent, under air pressure, to the sub-stations

engine, weighing 5 tons, to the 365-ton 2-10-2 type recently furnished the Baltimore & Ohio Railroad. Capacity of this plant is 65 locomotives per week.

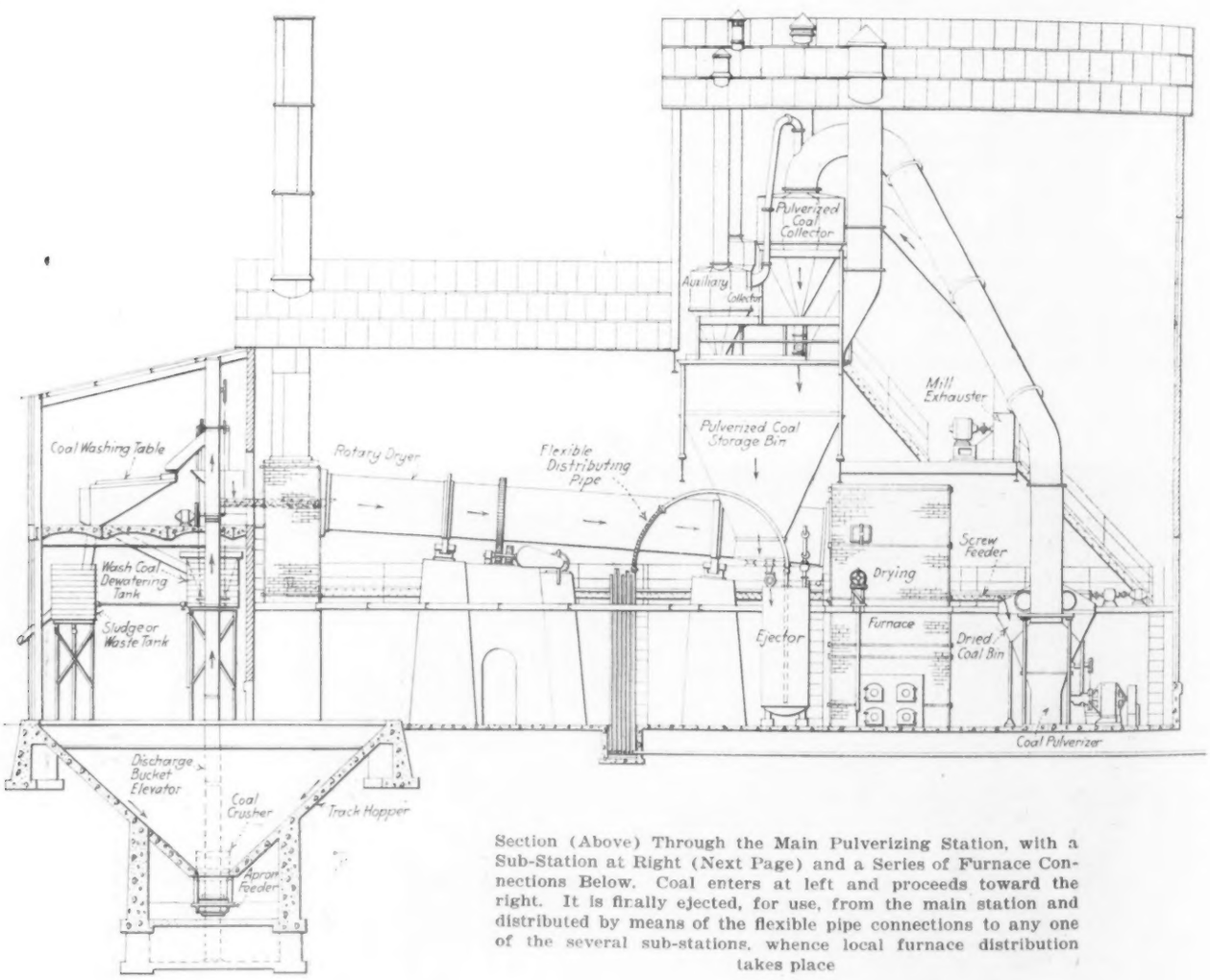
With such an output it is apparent that the fuel requirements for the various heating operations, which must be performed on the many parts requisite for the construction of a locomotive, will reach a figure of large proportions. The weekly fuel consumption of the Baldwin plant, as a whole, based upon an annual capacity of 3500 locomotives, is about 4200 net tons of coal and 175,000 gal. of oil.

An advantage possessed by this plant is that materials may be received, or locomotives may be shipped, by either rail or water. Thus fuel oil is received in barges and unloaded into large storage tanks. Locomotives, for export, are loaded direct into ships at the company's wharves.

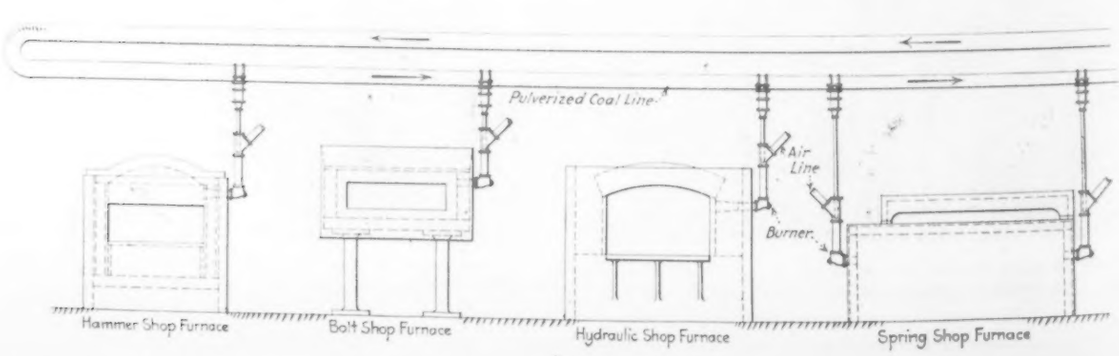
The powdered coal installation was completed about Jan. 1, 1922, since when it has been in operation practically continuously. The furnaces to be supplied covered a great diversity of types and considerable experimental work was necessary to adapt them to the fuel and secure the desired results. Not all furnaces were found adaptable for burning powdered coal and hence, for some operations on small furnaces, the original fuel is retained.

In its entirety, the powdered coal system comprises a main station and seven substations. The main station contains the necessary machinery for washing, crushing, drying, pulverizing and ejecting the fine coal to each substation. From the substations distribution is made to the individual furnaces.

In architectural design the main station conforms with the other buildings at the Eddystone plant. The walls are of hollow tile resting upon a concrete wall which extends around the base of the building and to a height of 40 in. The length inside columns is 84 ft. 4 in. and the width 31 ft. 7 in. Every precaution was taken to leave no ledges or surfaces on which coal dust might find lodgment.



Section (Above) Through the Main Pulverizing Station, with a Sub-Station at Right (Next Page) and a Series of Furnace Connections Below. Coal enters at left and proceeds toward the right. It is finally ejected, for use, from the main station and distributed by means of the flexible pipe connections to any one of the several sub-stations, whence local furnace distribution takes place



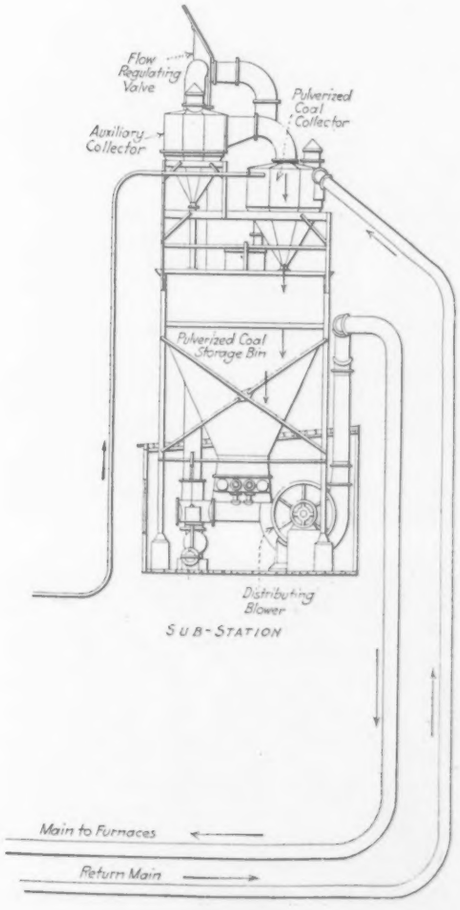
The concrete floor is provided with adequate drainage so that it can be flushed with ease. Ample light and ventilation are obtained by the installation of steel sash of the ventilator type. Electric lights are covered by wire cages and, as a further precaution, vapor-proof protection is provided.

A "flow sheet" for the coal, from the concrete hopper to the furnace, shows no deviation from accepted practice for this "low-pressure air distribution" type of plant. Several innovations in detail have, however, been incorporated and some variations made in individual equipment.

Four-Roll Crusher Used

The first change from usual procedure was the installation of a "four-roll" crusher instead of the single or double roll. This departure was for the purpose of securing coal crushed to a size suitable for "washing." The top rolls partially break down the lumps while the lower corrugated pair reduce the coal to approximately ½-in. cubes. The motive power for crushing is furnished by an individual constant-speed motor, while the belt taking the coal to the crusher from the concrete hopper has a variable speed drive.

When reduced to size, the coal drops into the boot of an elevator which lifts it and deposits it either on a washing table or into a small steel hopper. From the latter it passes into the dryer. The dryer and two



pulverizers are of the Bonnot air separation type. Each pulverizer has a capacity of 5 or 6 tons per hour. Two 25-ton storage bins receive the coal from the pulverizers and discharge it into ejector tanks placed directly beneath the bins.

Mention has been made of the washing table. This was installed for experimental purposes and to demonstrate the feasibility of eliminating a portion of the ash, and passing the coal direct into the dryer. While it is recognized that washed coal has been used in other places, the table has not elsewhere been incorporated as an integral part of the preparing machinery. This table is of the Deister type and was used continuously for several months, until the demand on the plant eventually exceeded its capacity at which time it was necessary to by-pass direct into dryer.

In addition to the removal of a very appreciable quantity of ash, all metallic substances and wood are thrown off, so that a magnet for trapping the tramp iron may be dispensed with. A test to determine the percentage of ash and sulphur taken out resulted as follows:

	Ash	Sulphur
Raw coal	9.30	2.10
Washed coal	6.74	1.63

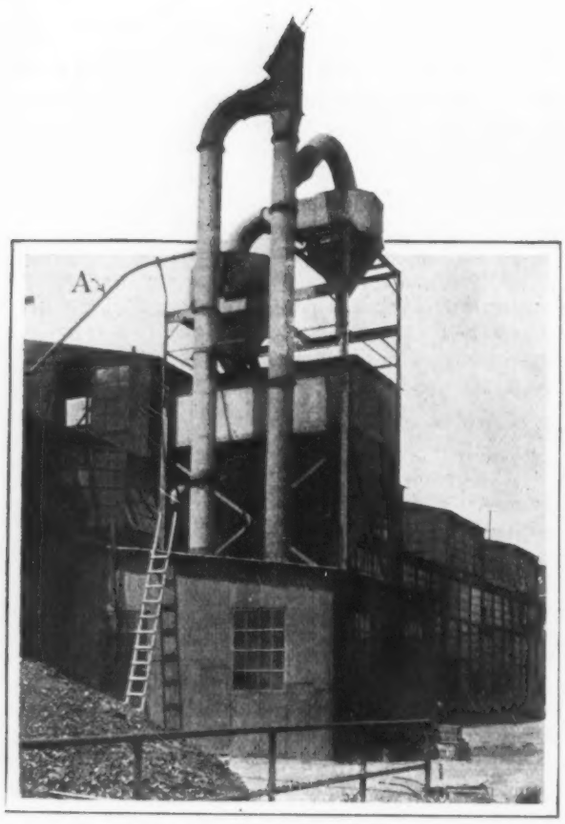
A 3-in. pipe conveys the coal, by means of compressed air, from the main station to the collector at each of the substations. These pipes, on leaving the main station, run underground in a concrete conduit and, rising, pass along or over the various buildings. One illustration shows the manner by which the discharge pipes from either of the two ejector tanks can be connected to the pipe leading to any one of the seven substations. There being two ejector tanks, it is possible to supply coal to two substations at the same time. The discharge pipe from each ejector tank terminates in a flexible hose. The seven pipes, with caps, lead to the seven substations. It is apparent that either flexible hose can be attached to any one of the seven pipes.

This construction eliminates the necessity of depending on valves for the distribution to the various substations. The air pressure required at the ejector tank varies according to the distance the coal must be carried. Substation No. 1 is about 180 ft. from the ejector tank and for this distance air at 15 lb. pressure will suffice. The distance to No. 5 substation is 800 ft. and to "shoot" the coal, 35 lb. air pressure is necessary. To the right of the pipes the electrically operated signal board can be seen, by means of which the attendant in the substation can indicate his desires as to coal supply. A "klaxon" is provided to work in conjunction with the signal board.

The equipment at each substation is inclosed by steel framework to which corrugated sheets are attached. All floors are concrete. With the exception of the size of the distributing fans and auxiliary apparatus, the seven stations are identical in principle. Five have a storage capacity of 15 tons while No. 1, which distributes coal to 51 furnaces, stores 25 tons and No. 7, which supplies the boilers and pile heating furnaces, has a storage of 50 tons. All substations are outside the buildings they serve, so there is no coal near the furnaces except that passing through the distributing line.

For distribution the principle followed is the conveyance of powdered coal through a spirally riveted pipe by means of an air current, created by a fan, and the return of the excess coal to a collector at which the pipe terminates. Branch pipes connect the spiral riveted main to the individual furnaces. The coal supply for each furnace is regulated by a valve in the branch pipe where it is joined to the main. The coal and air are mixed in the fan in the ratio of approximately, 1 lb. of coal to 60 cu. ft. of air and this mixture is then forced through the distributing pipe at an average pressure of 8 oz. The pressure at the burner is considerably less.

One important feature, tending to clarify the atmosphere in the substation building, is the maintenance of a slight suction therein. This suction is obtained by drawing all air required by the distributing



Substation Outside the Hammer Shop Which It Serves. The high-pressure pipe *A* brings the pulverized coal from the main station under 15 lb. of air pressure

fan from within the walls of the substation, so that any dust in the air is drawn into the fan and passes from it into the system.

No. 1 substation, for the hammer shop, was designed to serve 61 furnaces used principally to heat iron and steel for drop forging. In design, all are identical. To have well formed forgings the metal, when taken to the hammer, must be exceedingly hot and this is especially true of the iron. The maintenance of this high temperature in a comparatively small combustion space, with gases at a high velocity, necessitates for economical service a furnace construction which will stand up under the most severe usage. The proper disposal of the waste gases on leaving the furnace also presents a problem.

The type of furnace which satisfactorily met the above stipulation is shown. This design was adopted after much experimental work. The combustion chamber is 3 ft. 2 in. wide by 2 ft. 3 in. deep. The height to skew-back measures 2 ft. 3 in. The brickwork is held in place by tie rods extending across the top and bottom. The construction for the control of the spent gases is unique. The furnace is so formed that there are two compartments separated by the bricklined water-cooled door. The products of combustion pass from the combustion chamber, which forms one compartment, into the second compartment, the top of which slopes to a circular opening over which a stack is placed.

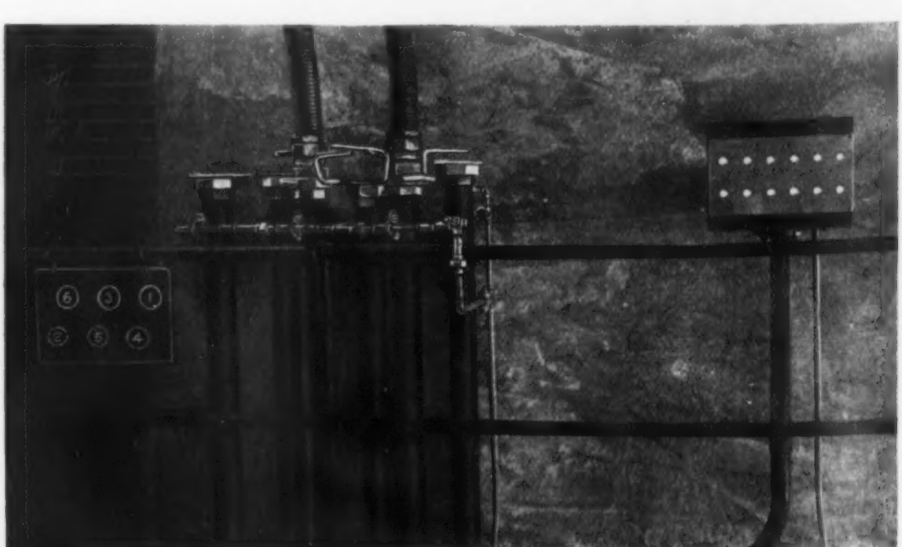
This front compartment, which is about 18 in. deep, has a heavy sheet iron door placed directly in front of the door between the two compartments. The function of this latter door is to seal the furnace, except when being charged, and to prevent the gases from passing into and contaminating the atmosphere of the shop. As compared to the conditions which existed before this design of furnace was installed there is a noticeable improvement, in that the air is clear and free from smoke and in the summer time it is much cooler.

The result of burning powdered coal in this shop has been a saving in fuel, longer life of the dies, less scrap, softer metal and less metal wasted by oxidation.

Substations Nos. 2, 3, 4, 5 and 6 furnish coal to five shops. The furnaces in these shops, where the character of the work permits, will be constructed on lines similar to the type used for drop forging. In some cases, due to the obstruction of overhead traveling cranes, it has been found impossible to install hoods with vent pipes and here, if powdered coal is burned, an exhaust system will have to be installed. These particular furnaces are few and represent a very small tonnage. The great majority of furnaces are used for forging or pressing and will burn powdered coal with first class results.

Substation with Two Outgoing Lines

There are two distributing lines from the largest substation, No. 7; one carries coal to four 600-hp. Babcock & Wilcox boilers and the second serves the three pile heating furnaces. The fans supplying the



Switching Arrangement in the Main Station. The two flexible hose carry pulverized coal from two ejector tanks. Either one may be connected to any of the distributing lines below them and the proper amount of coal, called for on the signal board at right, "shot" to the designated sub-station

two lines draw their coal from one hopper. The first application of powdered coal to these boilers was in the nature of an experiment and the equipment was not of a permanent class. But the results from this "make shift" installation were so encouraging that the complete substation was erected and provision made to include the pile furnaces.

The boilers have now been in operation for about a year and have in every way justified the use of powdered coal. Boiler ratings of from 150 to 200 per cent are usual. The steam generated is piped to the hammers in the forge shops, and then passes to turbines. There are a large number of hammers and it is apparent that the demand for steam will fluctuate widely, so that the supply must be exceedingly flexible. In meeting these "peaks" and "load drops" powdered coal finds a most fitting field.

During the week's run some slag will form in the bottom of the combustion chamber, but this is removed when the boiler is down over Sunday. There has been some erosion of the furnace walls, but this has not been severe. The features which have made powdered coal such an acceptable fuel for the boilers at this plant are: economy of labor and fuel, ease of furnace control and ability to meet quickly all demands for steam.

To attain the standard desired on the pile heating furnaces it was necessary to make considerable alterations in the furnace structure. When the correct construction was reached the furnace capacity was greater and the time of making "heats" less than had been the case with hand-firing. There was also a saving in fuel and labor and the life of the rolls was longer.

Flexibility Provided

Practically all the furnaces, including the boilers, are so equipped that either oil or powdered coal can be burned, as desired. By this arrangement the company is enabled to take advantage of any fluctuations in the price of oil or coal. The change from either fuel can be made in a short time.

Capacity production in the various shops will necessitate the operation of the preparing plant at maximum output and any additional fuel requirements will have to be met by the installation of another dryer and pulverizer. This contingency has been anticipated and space provided so that these pieces of equipment can be fitted in and connected up to that already in place.

Furnaces of Special Design to Use the Powdered Coal and Heat Iron or Steel Parts to Forging Conditions. There are two compartments, arranged for control of the spent gases

---

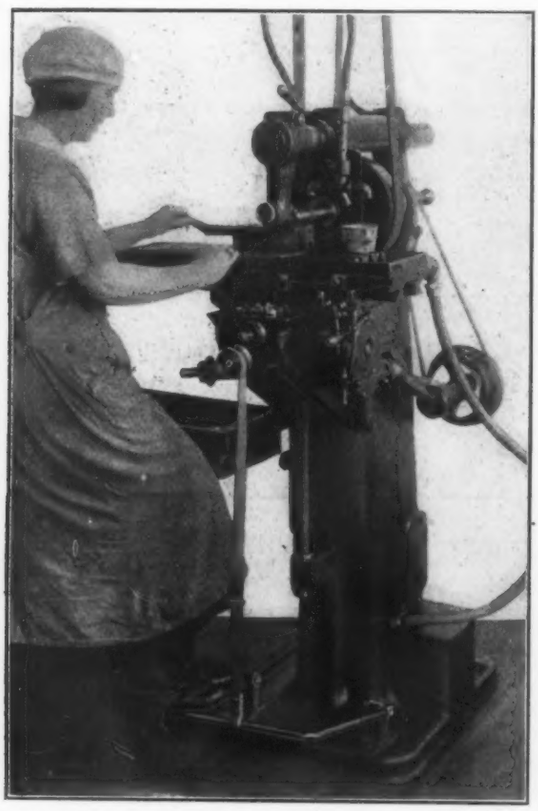
Roughly, 2100 workmen are employed by the Fore River Works, Bethlehem Shipbuilding Corporation, Ltd., whereas a month ago 2400 were on the payroll. Last year the plant averaged 3300 workmen, but in former years the normal force was around 8000. A Government cruiser has just been completed, a submarine is nearing completion, and a Government airplane carrier will be launched in the fall. All other work at the plant is of a repair nature.

The Singer Mfg. Co. has banked its Musconetcong furnace, Stanhope, N. J., for an indefinite period. The foundry, also, will be closed. About 100 men are affected.

Milling Machine Attachment for Rapid Production

A table attachment intended to convert the No. OY plain milling machine from a hand-operated to a semi-automatic unit, adapting it to rapid production work, has been placed on the market by the Brown & Sharpe Mfg. Co., Providence. It is claimed that with the attachment an average of 16 jobs taken at random from the operations adapted to this machine show, with the same speeds and feeds, an increase of over 20 per cent in production.

The application of the attachment may be noted from the accompanying illustration. There are few



The Table Attachment Converts the Milling Machine From a Hand-Operated to a Semi-Automatic Unit for Production Work

parts and these may be mounted without special tools. The table feed hand crank is replaced by a pulley from which a belt extends to a foot treadle as shown. Depressing the treadle rotates the pulley and moves the table to the cutting position, where the cutting feed is engaged. This also compresses a heavy spring and upon completion of the cut, a trip dog disengages the cutting feed, the spring returning the table automatically to the loading position.

The attachment reduces the hand movements required from five to two, and the non-cutting time 50 per cent by a fast advance and return of the work to and from the cutter. Both hands of the operator are free to adjust the work. A feature is that the attachment makes it impossible to jam the work into the cutter, which is emphasized as saving cutter expense and facilitating the breaking in of new operators. Production is materially increased if the cutting and loading time is short. If the loading is shorter than the cutting time, the automatic return of the table permits the operation of two machines with less fatigue, it is claimed, than the operation of one machine without the attachment.

The Mansfield Steel Corporation, Detroit, which was recently purchased by the Fisher Body Corporation, is a wire and iron works. This company is in no way connected with the Mansfield Sheet & Tin Plate Co., manufacturer of special finished sheets, Mansfield, Ohio.

Slide Rule Simplifies Design Work

A slide rule for standard parts, intended as an aid to draftsmen and designers and practically eliminating, it is claimed, mistakes in transferring standard dimensions to drawings and computations, is to be seen at the office of the American Engineering Standards Committee, 29 West Thirty-ninth Street, New York, which also has for distribution illustrated matter describing the device.

The rule was exhibited at the international standardization conference at Zurich, and has been placed on the market in Switzerland. It presents essential dimensions for the full series of the Swiss standard bolts, nuts and washers. By moving the slide to such position that the desired diameter appears through a window or opening in the fixed part of the rule, all the dimensions for the other parts of the bolt of that size appear in the corresponding rectangles on a clear diagram of the bolt which is engraved on the fixed part of the rule. In this way each dimension appears in exactly the place where it applies, the diameter of the washer, for example, appearing just where the washer would be dimensioned in any actual drawing incorporating the bolt, nut and washer combination.

In addition to the fundamental dimensions of the bolt itself, the rule provides a convenient means of showing also the diameter of the drill that is to be used for drilling a threaded hole to receive the bolt; the diameter of the cotter pin to be used; the effective cross sectional area of the bolt in square inches; its safe carrying capacity in pounds, and the working stress at that load in pounds per square inch. On the reverse side of the slide rule a similar presentation of the dimensions of two other standard design components, shaft keys and gas pipes.

The rule is emphasized as illustrating one of the advantages of standardization in favoring manufacturing economy. It is adapted to all cases where standard dimensions have been determined upon for parts, components or complete machines.

Wide Swing Floor Stand Grinder

A floor stand grinding machine, with a distance of 37 in. between grinding wheel centers, and particularly adapted for grinding operations necessary in fitting and assembling castings in stove, furnace and heater work, has been placed on the market by the Hisey-Wolf Machine Co., Cincinnati.

The machine is equipped with a 3 hp. motor and a safety automatic motor starter, which is intended to provide maximum protection to the motor. The control button is located at the front of the machine and the switch is inclosed in the base. The removal of a cover plate permits of convenient access to the switch mechanism.

The spindle, which is 1¼ in. in diameter at the wheels and of one-piece construction, is mounted in four ball bearings. The grinding wheels are 14 x 2 in. and buffing and wire brush wheels may be used, with or without wheel guards. A safety inclosed and combination wheel guard, which is fitted with removable end covers and exhaust pipe connection, is available. This guard is adjustable to any angle, may be moved back as the grinding wheel wears, and is interchangeable with the standard open-end guard provided. Grinding rests are adjustable and may conveniently be removed when desired.

The base of the machine measures 22 x 25 in., and the height from floor to center of spindle is 37 in. The weight of the machine is 660 lb. net.

The sixth annual edition (1924) of Fraser's directory of machinery, metal products and hardware has been published by the Fraser Publishing Co., Montreal, Canada. The names and addresses of Canadian manufacturers, dealers, agents and firms outside of Canada but represented in Canada, are given under classifications of the various products they handle. The size is 6½ x 9 in., 409 pages. The price is $3.

Trend in the Science of Metals

Relative Growth of Steel and Non-Ferrous Industries—Knowledge the Key to Expansion—Diffusion of Metals in Solid State

BY DR. ZAY JEFFRIES

EACH generation accepts the developments of the preceding generations without full appreciation of the difficulties which had to be overcome or the effect of any given development on society. Today the production of pig iron is the yardstick with which general industrial health and progress are measured. So natural and logical does this seem to us that it is difficult to picture conditions prior to the fourteenth century, when pig iron was unknown. Not only was pig iron unknown but iron or steel could not be melted and poured into castings; all iron and steel articles were forged from sponge iron.

Steel and Non-Ferrous Industries Compared

All castings as well as many worked articles were made of non-ferrous metals or alloys. In many parts of the world over long periods of time not only was the annual exchange value of non-ferrous metals greater than that of iron and steel, but also their combined tonnage was greater. At present the value of the pig iron produced in a year is of the same order of magnitude as that of all non-ferrous metals combined; the tonnage of pig iron is, however, about 20 times that of all non-ferrous metals combined.

Owing to lack of records we will probably never know the relative importance of the various metals at all periods in historic times. A certain conclusion is that the iron and steel industry, since the discovery of pig iron and the cheap methods of converting it into steel, has grown at a much more rapid rate than the non-ferrous metal industries. Notwithstanding their fundamental fitness for man's needs, iron and steel owe their importance in no small degree to the low cost of production. The low cost was a result of increased knowledge of the production appliances and of the metallurgical processes. This increased knowledge is the key to our modern industrial civilization.

It will remain for future generations to determine whether there is now going on a gradual change toward greater relative importance of the non-ferrous metals as compared to iron and steel. The world's pig iron production in 1920 was slightly more than twice what it was in 1890, whereas the non-ferrous metals production in 1920 was about two and one-half times that in 1890. Every non-ferrous metal industry has shown marked growth during the last 30 years. During this period the production of copper, nickel and aluminum has increased at a much faster rate than that of pig iron.

Relative Importance of Various Metals

Assuming different degrees of fitness for industrial uses, the relative importance of the various metals depends on:

1. Cost of production;
2. Knowledge of properties and shapes desired for industrial uses;
3. The state of the science of metals, i.e., the knowledge of the properties of metals and their alloys and of the processes of fabrication.

In the growth of any particular metal industry all of these factors are inter-related. A revolutionary discovery in any one of these fields may result in a marked increase in demand. Also increased knowledge of any metal may greatly change its rate of growth.

The Institute of Metals division of this society is principally interested in the third item—the Science of Metals. We will confine the discussion this afternoon to certain aspects of this subject.

Many physical and mechanical properties must be considered in the selection of metals and alloys, for industrial uses, namely, resistance to corrosion, electrical conductivity, magnetic properties, melting point, vapor pressure, bearing qualities, machineability, coefficient of expansion, strength, elastic limit, hardness, elongation and reduction of area after rupture by tension, resistance to repeated stresses, resistance to impact, etc. Sometimes a number of these properties must be within specified limits in the same material. Again some property, not here specified, may be essential in order to fabricate a desired article.

Plasticity and Hardness

If we consider the various properties of metals from the standpoint of their contribution to usefulness there is probably good agreement that plasticity and hardness rank first. If we examine all of the uses of metals we can find no considerable use in which either or both of these properties is an unimportant factor. Drawn copper wire for example may be used for a conductor of electricity in places where its hardness or even its plas-

TWO years ago the Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers inaugurated the presentation of an annual lecture at the regular February convention of the mining engineers in New York. The leading scientists of this and other countries have been selected and are scheduled for the presentation of this lecture. The first one was delivered by Prof. W. G. Bancroft, Cornell University, in February, 1922, and the second one was delivered by Dr. Walter Rosenhain, a leading British metallurgist. The lecture this year, part of which is presented in abstract herewith, was delivered Monday afternoon, Feb. 18, by Dr. Zay Jeffries, director of research, Aluminum Co. of America, Cleveland. Dr. Jeffries occupies a leading place among American metallurgists, having contributed many valuable papers on steel and non-ferrous metallurgy. The work of himself and his associates on the presentation of a new theory for the hardness of metals is an outstanding achievement of recent years.

ticity may not be an important factor, but if it were not plastic it could not have been drawn into wire. The use of cast iron would be very limited if it were as soft as lead. Furthermore, the high compressive strength and the machineability of cast iron are due in a large measure to the plasticity of the main constituent, ferrite. Important as the subject of hardness is, it has received sufficient attention during the last few years so that one would not be warranted in giving it further consideration today.

Each year the chances are becoming less for the layman to make signal advances in the science of metals. The trend in the science is in the direction of atomic physics. The old tools are not being discarded but are being used more and with better understanding. New tools are being developed which have already greatly enriched our knowledge and promise even greater things in the future. New developments are now often the result of laborious researches involving a profound study in fields which have been worked over, on the surface, many times; the tools available permit us to make a more profound study than could have been made even two decades ago.

I have decided to discuss two subjects the knowledge of which has been greatly augmented by the new physical methods of attack, namely, "Diffusion in the Solid State" and "Plasticity." At the outset I wish to express my indebtedness to my associates, Messrs. Archer, Sykes, Gladding, Karrer, Bain, Tarasov and Doran.

Diffusion in the Solid State

The diffusion of carbon into solid iron at an orange heat has been practiced for thousands of years, but it is only in recent times that this process has been crudely understood. Two notable researches on diffusion in the solid state are those of Roberts-Austen* who studied the rate of diffusion of gold from a lead-gold alloy into pure lead, and Bruni and Meneghini,† who studied the inter-diffusion of copper and nickel.

The experiments on copper and nickel are typical cases of diffusion in the solid state. A nickel wire 0.5 mm. diam. was coated electrolytically with sufficient copper to make the mixture correspond to 59 per cent copper and 41 per cent nickel. The compound wire was heated in a hydrogen atmosphere to 1000 deg. C. and the electrical conductivity was measured from time to time. The progress of diffusion was followed by the decrease in conductivity. The conductivity reached a constant value after 140 hr. which value was the same as that of a homogeneous alloy of the same composition. The color of the copper had changed from red to white and other tests confirmed the conclusion that both core and shell were of the same composition after the long heating. Copper and nickel form an unbroken series of solid solutions. It is a requirement in such solid solution alloy systems that either element should diffuse in the other in the solid state.

In any case of diffusion in the solid state there is usually some low temperature, at which diffusion will not take place, or what practically amounts to the same thing, a temperature at which the rate of diffusion is imperceptible. The rate of diffusion increases rapidly with rise in temperature. The rates vary, however, in specific instances. From the experiments cited above on copper and nickel it is evident that the copper atoms must have traveled half the diameter of the nickel wire or 0.025 mm. in 140 hr.

[The author then discusses the interesting case of the diffusion of thorium and tungsten.]

This case of diffusion in the solid state is not only important because of its great practical use but because of the method of study which provides a means of determining the state of combination of the foreign atoms when other methods fail, and because of the example of how one property of a metal is increased many thousand times by the presence of as little of another substance as one part in 40,000.

[There follows here a discussion of the change in particle size in the solid state in an alloy of aluminum, copper and magnesium.]

Diffusion Force and Resistance

There must be a "diffusion force" and a "diffusion resistance." While diffusion is progressing the force must be greater than the resistance. When there is no diffusion either the force and resistance are equal, which is the condition for equilibrium, or the resistance must be greater than the force, which is the condition at temperatures too low for diffusion. Each of these factors is obviously a complex. Diffusion force probably depends largely on:

1. Concentration gradient, and,
2. Relative attractive force between like and unlike atoms.

The greater the concentration gradient and the more the mutual attraction of the unlike atoms exceeds that between the like atoms the greater should be the diffusion force. Diffusion resistance probably depends largely on:

1. Temperature,
2. Atom size, and,
3. Dimensions and type of space lattice.

It is easy to understand why the diffusion resistance would be lower the higher the temperature; the space lattice becomes larger and the force required to move the atoms relative to one another is decreased. It is not easy, however, to comprehend why diffusion in the solid state takes place at all. The atoms are very resistant to deformation as evidenced by the large forces required to deform metals elastically. Steel stressed to 300,000 lb. per sq. in. elastically in tension has its space lattice extended only one per cent. With such great forces required for so little deformation it is difficult to understand how two atoms could exchange places.

[Dr. Jeffries then discusses the matter of particle growth in complex alloys, in high-speed steel, stating that instances of this phenomenon in solid metals are much more numerous than at first suspected.]

(To be concluded)

*Philosophical Transactions, 1896, Vol. 187, A, p. 383.

†*Internationale Zeitschrift für Metallographie*, 1912, Vol. 2, p. 26. Desch, "Diffusion in Solids," Reports on the State of Science, 1912, p. 358.

Extensive Improvements of Light and Power Plant at St. Louis

ST. LOUIS, Feb. 19.—The Union Electric Light & Power Co. will spend $100,000,000 for improvements in the St. Louis industrial district within the next six years, said Louis H. Egan, president of the company, in an address in Hotel Statler, before the Rotary Clubs of St. Louis, East St. Louis and Belleville. He also said that Cahokia, the power plant of the company on the east side of the Mississippi River, opposite St. Louis, had already cost $12,000,000, that $5,000,000 additional would be spent in 1924, and that when completed it would represent an outlay approaching $35,000,000.

"When we spend $35,000,000 upon a power plant," said Mr. Egan, "we must spend double that amount in cables, conduits, transformers, poles, wires and other equipment necessary to deliver the power to the switches of the consumer."

Standardizing Materials in Japan

WASHINGTON, Feb. 19.—The Japanese committee assigned to the work of standardization will direct its efforts largely to the standardization of structural steel materials, brick and lumber for the present in order to hasten reconstruction as the result of the recent earthquake and fire, says a statement issued by the Department of Commerce. Up to the close of December the committee had fixed the gages of wire and sheets and submitted recommendations to the Minister of Agriculture and Commerce. It is understood that agents have been sent abroad to study and report upon methods of standardization employed in foreign countries.

Panorama of Plant From By-Product Side, Showing Benzol Plant at the Left, By-Product Building at Right, with Coal Handling Equipment and Battery Beyond

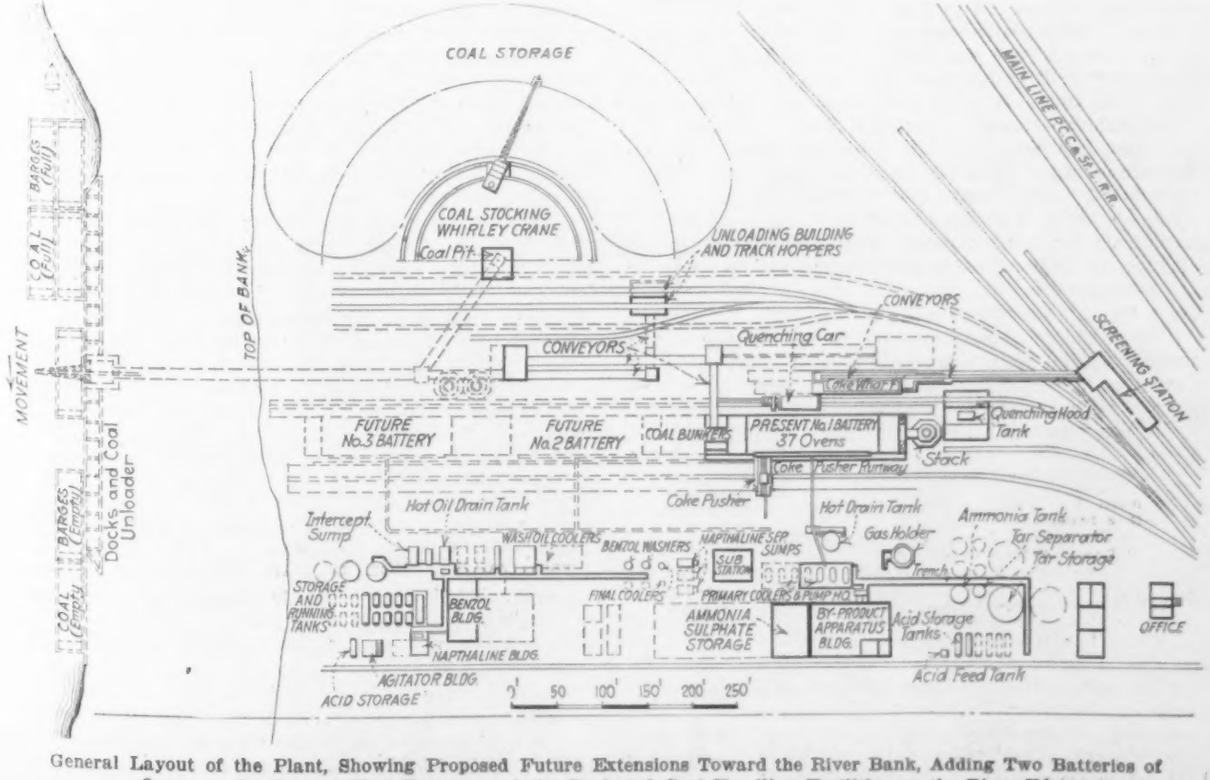
Weirton's New By-Product Coke Plant

New Plant Has Battery of 37 Koppers Co. Becker Type Ovens of 14-In. Width—Using High-Volatile Coal

BY C. H. HUNT

SEVEN minutes past seven on the seventh day of the seventh month the first coke was pushed from the new ovens at the new by-product coke plant of the Weirton Steel Co. This completes the final link in the chain at Weirton, W. Va., giving control of all facilities and processes for the production of the usual raw materials entering into the various highly finished products of the company, ready for delivery to the consumer. It also inaugurates a new era in the by-product coke industry, of interest to the industry at large, being the first battery of ovens designed for high-capacity short coking time, with 14-in. oven width, to operate in the steel industry for the production of blast furnace coke from high-volatile coal exclusively.

Need for by-product coke ovens adjacent to the blast furnace and steel plant was felt even before the steel plant went into operation, due not only to the high cost and waste of the beehive method of making coke but also to the difficulties in maintaining schedules from the mine to the furnace, with uncertainties of trans-



General Layout of the Plant, Showing Proposed Future Extensions Toward the River Bank, Adding Two Batteries of Ovens to the Present First Battery, and the Projected Coal Handling Facilities on the River Edge

portation, strikes and car shortage, it having been necessary to purchase 240 coke cars to be assured of cars to move the coke as required.

On the Ohio River bank, paralleling the tin mills, the plant was laid out with arrangements for receiving coal by river and unloading it from barges and delivering it to the breakers at the coke plant, with storage space for 280,000 tons as insurance against low or frozen river and other contingencies. River equipment and unloading docks, also loading facilities up-river to permit transporting coal by water, are to be installed in the near future. This location permits a system of

CLINTON H. HUNT, Chief Engineer Weirton Steel Co., Weirton, W. Va., Has Been Engaged in Engineering Work for the Past 24 Years. He was chief engineer William Todd Co., Youngstown, Ohio, for a period of two years and, before assuming his present position with the Weirton Steel Co. seven years ago, had been assistant engineer Youngstown Sheet & Tube Co. for four years. He was born in Cleveland in 1883

gas lines for distribution of the surplus gas from the coke plant to the other departments of the plant, where its use will effect great economies and, with the completion of river transportation, will make possible the delivery of coke to the blast furnace entirely within the company's control and at the lowest possible cost.

In the consideration of a by-product coke plant, the first requisite was for a quality of coke which would permit maximum production from the blast furnace from as large a percentage as possible of the company's ores. Then, as the company had purchased the mine and property of the Redstone Coal & Coke Co. in November, 1922, and also owns 1000 acres of coal near the Monongahela River at Brownsville, Pa., it became essential that this coke be made from the maximum percentage of this high-volatile coal. Addition of low-volatile coal would materially increase the cost of the coke, on account of its higher cost and long freight haul from the Kentucky and West Virginia fields, and also, its production and transportation not being under the company's control, the elimination of the necessity for it was highly desirable.

The problem then was to determine whether a coke possessing the following qualities and characteristics, generally accepted by blast furnace and coke oven operators as necessary for good blast furnace performance, could be made from 100 per cent high-volatile coal:

Good combustibility, to burn evenly at the tuyeres of the blast furnace, maintaining the zone of combustion low down in the bosh of the furnace, where it is needed.

Strength, to prevent crushing in the furnace, due to heavy weight of the burden.

Uniformity of cell structure.

Absence of cross fracture, which would cause it to break into small pieces when being handled from coke plant into furnace.

Of blocky instead of fingery structure.

Uniformity of size.

Various coking coals and mixtures of coals require different treatment during the coking process, such as length of coking time and degree of heat under which the coking is completed to produce coke best suited for blast furnace purposes. The following is a fair average analysis of the coal to be coked:

	Per Cent
Volatile matter	33.25
Fixed carbon	57.97
Ash	8.59
Sulphur	1.09
Moisture	2.5 to 3.5

While a first quality coking coal mixture will make good coke, independently of oven width and temperatures, this is not true of straight high-volatile coal, especially with coal containing over 30 per cent volatile matter, for the reason that such coals contain an excess of bituminous matter which, during the process of distillation in the oven, has a tendency to condense in the center of the charge and to form a spongy coke of low quality. The customary remedy for eliminating sponge in the ordinary type of oven, and one that is nearly always effective, is to mix with the high-volatile coal a sufficient quantity of low-volatile coal to absorb the excess bituminous material and to eliminate the condition of sponge formation. Different coals require considerably variant percentages of low-volatile coal to eliminate the sponge completely.

Coals containing over 30 per cent volatile matter also are apt to have a fingery tendency in coking; that is, the coke forms with a greater number of seams perpendicular to the oven walls which, on account of the small cross section, break up into small, short pieces during the necessary handling. This becomes pronounced if the coal is of high oxygen content, and is likewise encountered in coals which have remained in stock piles for a considerable length of time.

It has been demonstrated, to the satisfaction of the majority of coke oven and blast furnace operators, that, especially from high-volatile coal, better coke can be made in narrower ovens. By careful study of the results obtained and tests made with high-volatile coal in the five Koppers experimental ovens of the Becker type, 14 in. wide, at the plant of the Chicago By-Product Coke Co., it was found that the percentage of such low-quality coke can be reduced and, in fact, practically eliminated by coking to the center of the charge quickly, so as to avoid excessive condensation and spongy formation toward the center. This can be accomplished in the narrower oven at relatively lower coking temperature, as the narrow fused coking zones are driven to the center of the oven from both walls more quickly in the narrow than in wide ovens, due to the shorter distance the heat must penetrate.

Also, when coking high-volatile coals or coals of a high oxygen content, by coking at temperatures somewhat lower than used in ordinary practice, the fingery tendency may in many cases be entirely eliminated, as over-coking and high temperatures tend to produce fingery or small size coke. By careful heat treatment, well regulated during the coking process, especially in the case of the narrower ovens, firm, blocky coke may be made from coal usually regarded as having a fingery tendency.

The heat applied to the coking mass from the oven wall must be uniform from end to end of the oven, and also from top to bottom of the oven, except for the usual thin layer on top of the coking mass, to protect the space in the upper part of the oven from high temperatures destructive to by-product recovery. The coking should reach the center of the oven over the total area of the oven at the same time, otherwise the portion which has been completely coked will become over-coked in order to complete the lagging portion. With the old-style wide oven it is necessary to apply the heat longer and at higher temperatures to drive the heat to the center of the coal mass. This produces coke of unequal structure from wall to center, due to over-coking at the wall end, and is apt to cause cross fracture. With the narrower oven, with shorter coking time, the heat will penetrate to the center of the oven with equal or even lower temperatures in a shorter time and make a more uniformly strong, blocky coke.

After a thorough investigation of various types and designs of ovens, the new development by the Koppers Co. in the coke oven design, as embodied in the Becker type of narrow width, was chosen as fulfilling various requirements essential to the conversion of high-volatile coal into blast furnace coke. This type of oven was

described in a paper by Joseph Becker, read before the Eastern States Blast Furnace and Coke Oven Association. [See THE IRON AGE, Nov. 16, 1922, page 1275.]

In the old style Koppers ovens operating on longer coking time, the quantity of gas per flue becomes correspondingly less and the combustion is quicker and the flame shorter. Thus the bottom of the oven is completely coked in advance of the top and, to complete the coking of the top portion, longer application of heat at the bottom increases the temperatures in the oven walls, causing over-coking of the mass in the bottom of the oven.

In the new type of oven, which is of the vertical rectangular flue design, one side of the oven is heated in its entirety. The products of combustion, joining in the horizontal flues, pass over the top of the oven, through cross-over flues—one pair located on the coke side and the other pair on the pusher side. The products of combustion then enter the horizontal flues of the adjacent heating wall and pass downward throughout the entire wall into the regenerators.

The flow of gases has been worked out so that there is a minimum of leakage between individual flues, since adjacent flues are all working under the same flow and pressure condition, there being no counter-flow in any adjacent heating flues. This theory has also been carried out in the arrangement and design of the regenerators, which reverse longitudinally with the battery instead of crossways, as in the older type.

Due to the design of these flues and the faster heat absorption, the height of the flame in the flues has been increased until it extends far up toward the top of the oven, with the result that the heating of the coal charge is uniform over the entire area in contact with the oven wall, so that the coking reaches the center of the oven over the total area at virtually the same time.

The ovens were built with combination regenerators, to permit the use of blast furnace or producer gas at any time, so that all of the coke oven gas can be utilized as fuel throughout the plants. In case producer or blast furnace gas is used the arrangement of regenerators and flow of gas are such that there does not exist at any time counterflow between incoming fuel gas and outgoing products of combustion in adjacent regenerator chambers. Fuel gas and outgoing products of combustion are separated by a regenerator containing ingoing air and, should a slight leakage occur in the waste-gas regenerator chamber, it can result only in the loss of air and it would be impossible to waste producer or blast furnace gas. These features minimize the dangers of leakage from one part of the oven to the other as the battery gets old, with lessened liability of damage by local overheating of the brickwork on account of leaks through cracks or joints, due to the relatively low differential pressures existing in any part of the battery. Arrangement of flues and regenerators is such that it has been found possible to maintain lower uniform stack temperature, indicating less waste of heat to the stack and lower fuel consumption for heating the ovens, due to more efficient heat distribution and transmission to the coal.

The following comparison at Chicago indicates the above advantage of the new design of oven:

Width of Oven	Coking Time	Temperatures Flue (Deg. Fahr.)	Temperatures Stack (Deg. Fahr.)	Fuel Gas Pressure	Stack Draft	Flue Differential
14 in.	14 hr.	2,300	500	150 mm.	23 mm.	6 mm.
16 in.	16 hr.	2,550	575	90 mm.	14 mm.	9 mm.

From this it will be observed that the new type of oven operates at an equivalent coking speed with less flue temperatures, also lower stack temperature, with a more nearly balanced condition indicated by the lower flue differential pressure. By tests made on the experimental ovens at Chicago it was demonstrated that about 200 deg. less temperature is required in this type of oven for the same oven width as compared with the older type. With the same flue temperature the new type 14-in. oven will coke in 11 hr., as compared with 16-hr. coking time of the old type 16-in. oven.

Coke from the new ovens is more uniform in temperature when pushed, also both in size and structure and from all parts of the oven, as it is unnecessary to over-coke one portion of the oven in order to coke another properly. The porosity of coke from 16-in. ovens is 52 per cent; comparative porosity of coke in 14-in. ovens is 55 per cent. The shatter test shows

Battery of 37 Koppers Becker-Type Ovens, With Capacity to Carbonize 1100 Tons of Coal per Day, Viewed From Pusher Side. Coal bin and head of coal conveyors shown at left. Arrangement of gas collecting main along the battery, with cross-over main, is shown leading to the by-product building at the right

10 per cent better on coke from 14-in. oven and with better combustibility. Coke can be made from high-volatile coal with lower temperatures in the heating walls in the new type of oven as compared with the old type, without sacrificing speed.

These various points were considered sufficient to justify building a plant to operate exclusively with high-volatile coal, although provision has been made in the layout for the installation of pulverizers and for mixing coal, should it be deemed necessary or feasible in the future to do so. In this decision the Weirton Steel Co. was the pioneer in the adoption of the new type narrow oven, as the plant went into operation a year before any other ovens contracted for or contemplated will be finished.

Demand of the blast furnace was for not less than 600 net tons of furnace coke per day. To meet this demand it was decided to install one battery of 37 ovens, each oven having a capacity of 544 cu. ft. or 13.6 net tons, based on coal at 50 lb. per cu. ft., thus establishing a new record for the minimum of ovens required for a like production of coke per day, and consequently for minimum investment required per ton of coke produced. The builder guaranteed this production of 600 tons of furnace coke per day over a 1¼-in. revolving grizzly screen, coke passing through the grizzly to be rescreened on a 1¼-in. shaking screen and all coke passing over this screen to return to the furnace coke.

The Ovens

The ovens are 41 ft. long, face to face of doors, 12 ft. 8 in. high, 13¼ in. wide at the pusher side and 14¾ in. wide at the coke side, an average of 14 in. width. The ovens are spaced 3 ft. 6¼ in., center to center, and are the Koppers patented cross regenerative combination oven with two regenerators per oven, so that they can be operated in the future with either producer gas or coke oven gas. The heating chambers are rectangular flue construction with 31 vertical flues. Four cross-over flues connect the horizontal flues on either side of the oven chamber.

Sil-o-cel insulating material is used to insulate the ends of the regenerators, the horizontal flues and the cross flues. Cast iron face plates are provided between the vertical buckstays and the brickwork between the ovens. These are sectional, of the same height as the jamb brick, and extend in to form the jamb for the doors; the lintels also being faced with cast iron lintel plates. Sil-o-cel insulation is provided in spaces between the brickwork and the jamb plates and also as packing in the oven doors, assuring comparatively cool benches.

The pusher side bench is 7 ft. 4 in. wide and the coke side bench 7 ft. 10 in. wide, with smooth finished reinforced concrete floors; also extending across at each end of the battery to form connecting walks. A brick-inclosed room at bench level at the east end of the battery, back of the pinion walls, contains the reversing mechanism and battery instruments, while at the opposite end of the battery, underneath the coal bin at bench level, are two rooms, also brick inclosed, one containing the wet pan for mixing luting clay, with storage and handling facilities for it, the other a service and sanitary station for battery coal and coke handling men.

Fuel gas for heating the ovens is delivered from the 10,000 cu. ft. fuel gas holder through a 16-in. main by two branches, with a Venturi meter in each branch, to a 12-in. main on each side of the battery, from which it is introduced alternately to each side of the ovens by reversing cocks and connections, with regulating cocks to the gun brick connecting to the ports in each heating flue. The gas gun castings are provided with decarbonizing caps connected with the reversing mechanism, so that they open on reversal of the gas to the opposite side, admitting a small quantity of air through the gun brick and nozzles, burning out any carbon deposited there.

Air for combustion enters the regenerators for each oven through cast iron reversing valves, four for each oven, one on each end of the two regenerator chambers. These valves serve also to convey the waste gases to the waste heat flues, a cast iron disk valve operating between air and flue openings. A butterfly damper in the flue connection to each valve, hand adjustable, provides individual regulation of the draft conditions from the regenerators, while finger bars over the air inlet openings control the amount of air admitted, affording complete control of air and draft to compensate for relative distance of oven to stack and other variable conditions.

Control of Gases and Heating

Waste-heat flues from each side of the battery are connected to a common reinforced concrete stack 8 ft. in diameter, 200 ft. high, with perforated radial brick lining. A regulating damper is provided in each waste-heat flue and a stack damper in the flue leading to the stack, thus providing means for controlling the draft on each side of the battery and for the battery as a whole, and, as is common in Koppers ovens, with means for regulating the admission of gas and air to each vertical heating flue by changeable gas nozzle brick and by adjustable sliding brick over each flue regulating the down draft in each flue. Every facility is provided to control the heating so as to maintain uniform temperature from end to end of the ovens and in all ovens from end to end of the battery, which has proved of particular advantage in this plant for properly coking high-volatile coal.

Air and draft valves and gas reversing cocks are all operated by a single reversing unit, motor driven and timed to reverse every 20 min. by an electrical timing device energized by a clock.

Gas from the oven enters the collecting main through ascension pipes provided with cast steel butterfly valves. The collecting main is 60 in. in diameter. Gas leaves the ovens at a temperature of approximately 1000 deg. Fahr., and is sprayed with tar and ammonia liquor by sprays located about every 4 ft. along the main, so that the gas enters the suction main at less than 210 deg. Fahr. The collecting main slopes from both ends toward the 36-in. suction main connection at the center of the battery. The heavy tars are condensed out of the gas in the collecting main and washed along by the flushing liquor to the suction main, which is so arranged that the tar and liquor flow from the collecting main through pitch traps and back through the suction main to the hot drain tank, while the gas passes through a by-pass, with butterfly valve for regulating the gas pressure in the collecting main, controlled by a Koppers automatic governor operated by oil pressure.

Coal and Coke Handling

The general plan layout of the plant indicates provisions for future extensions, including coal handling facilities from river barges. Coal is received at present by rail and can go direct to the ovens or be sent to storage by discharging from the bottom of the cars into an unloading pit and thrown back onto the storage pile by a fixed radius whirly crane operating on a semi-circular track. This crane is equipped with a 5-cu. yd. bucket and boom 100 ft. long, and is utilized also for reclaiming from storage into cars for delivery to the ovens, this arrangement being adequate until additional batteries are added, when more extensive storage and reclaiming facilities are contemplated.

Coal going to the ovens is delivered to the unloading building at yard level and from the bottom of the cars into two track hoppers. Duplex reciprocating feeders deliver the coal onto a 36-in. belt 20 ft. below yard level, which conveys up an 18-deg. slope to the junction house at yard level and onto a 36-in. belt at right angles, also at a slope of 18 deg., to the top of the breaker building 35 ft. above the level of the yard. The breaker building houses a 12-ft. by 17-ft. Bradford breaker, which breaks the coal up to pass through 1½ in. diameter perforations, the refuse, slate, bits of iron, etc., being discharged from the end of the breaker by a chute into a car at the north end of the building. The conveyor chutes and building are arranged for extension to accommodate a second breaker.

After passing through the breakers, coal is conveyed by a 30-in. belt up a 20-deg. incline to a transfer tower and then at right angles for a distance of 85 ft. over a 30-in. belt to the headhouse over the coal bunkers, 110 ft. above yard level. The coal bunker over the west end of the battery has a capacity of 1000 tons and is divided into two sections. Provision is made for addition of bunkers to hold 3000 tons of coal to serve an ultimate of three batteries of ovens and for the installation of a shuttle conveyor at that time to deliver coal from the head of the conveyor to any bin. All conveyors are designed so that 3000 tons of coal can be handled in 10 hr. by increasing the speed of the belts.

Coal is drawn from the bunkers through four manually operated cut-off gates in the bottom of each bin into a specially designed larry car, having four cone-shaped hoppers. Attached at the top of each hopper, just beneath the coal gate, is an annular ring 3 ft. in diameter of adjustable height, through which the coal flows into the hopper and into which the coal rises when the hopper is filled, the height of the coal in this ring serving to measure the exact volume of coal in the hopper so that, when charged into the oven and levelled, a predetermined space remains between the top of the coal and the top of the oven for the rapid passage of the gases out of the oven chamber. This measuring also successfully serves in place of the usual scale of the larry car.

During the operation of levelling the coal in the top of the oven a small amount of coal is withdrawn by the action of the leveller bar. This coal is caught and accumulated in a hopper on the pusher machine and periodically discharged into a hopper beneath yard level adjacent to the coal bin structure, from which it is conveyed by apron conveyor under the bench inclosure to a bucket elevator and elevated to a small bin at the side of the coal bin, from which it is returned by the larry car to the ovens.

Coke Handling

On completion of the coking period, which at present is 11 hr. 46 min., the coke is pushed from the oven by the usual type pusher and levelling machine, except that, on account of the exceptional height of the oven chambers, and consequently the increased height of the regenerators, the sill line being 14 ft. 3 in. above yard level, a sturdier and heavier machine was designed, due to the height of the ram above the rails. The door extractor for the doors on the pusher side is a part of the pusher machine.

A new heavier type door extractor was designed by the Koppers Co. for handling the doors on the coke side of the battery. The door lifting levers, door pulling mechanism and travel along the bench are all motor operated. This machine propels and spots the coke guide in position ready for pushing. There are two quenching cars, one being a spare of the usual type, lined with cast iron plates and having discharge doors operated by air cylinders controlled from the cab of the 20-ton electric quenching locomotive.

The quenching station, located at the stack end of the battery, consists of a rectangular brick structure 17 ft. wide, 50 ft. long and 48 ft. high, open at the top, the area being sufficient to inclose the quenching car entirely. Ample arches at each end allow the car and locomotive to be taken through for repair or replacement and for a standard locomotive or locomotive crane to run in on the quencher track for emergency purposes.

Water for quenching flows by gravity from a 12,000-gal. tank, elevated on a steel structure located alongside, into sprinkler pipes supported and located over the car, so as quickly and uniformly to quench the hot coke, requiring about 40 sec. The water then flows to a settling basin, which collects small coke washed into it, the water flowing under baffles and through a screen into a clear well, from which it is raised by a 25,000-gal. per hr. centrifugal pump against 70 ft. head, into the quenching tank. The motor is float controlled from the water level in the tank. Water to replace that lost by evaporation, amounting to about 15 per cent, is admitted by a flat controlled valve into the clear well from the service water line. The feed line to the sprays is 12 in., with a quick opening valve arranged to be operated readily from the quenching locomotive cab.

To avoid excessive moisture in the coke after quenching has been completed, a 12-in. drain valve in the feed line to the sprinklers is automatically opened on closure of the service valve. This quickly discharges all water remaining in the lines and sprinkler pipes back into the clear well, so that there is no after drip from the sprinklers to be absorbed by the coke, allowing the car to remain in the quenching station until drainage from the coke is completed.

After quenching, the coke is discharged onto a coke wharf 84 ft. 5 in. long, inclined at an angle of 26 deg. to the horizontal and covered with special cast iron wearing plates. These plates are laid with their edges flush instead of overlapping, to minimize coke breakage, and for the same reason the usual type of rotary feeders are omitted. After being spot quenched, where any fire remains, and cooled, the coke is discharged direct onto the coke conveyor belt, the flow from the wharf being regulated by cut-off gates composed of ⅞-in. square finger bars with handles extended within reach from the operators' platform along the length of the coke wharf.

Coke Screening Station

The wharf conveyor belt, 36 in. wide and 97 ft. 3 in. long, center to center of pulleys, discharges onto a 30-in. inclined conveyor 237 ft. centers, which delivers the coke onto a 4-ft. wide revolving grizzly screen with 11 in. diameter disks spaced to give an average of 1¼-in. openings. The furnace coke which passes over the grizzly screen is delivered by a curved chute at an angle of 49 deg. onto a 36-in. boom conveyor 96 ft. centers. A portion of this conveyor, 57 ft. long, is carried on a boom structure hinged at one end and raised or lowered at the delivery end by a 3-ton electric hoist, the weight being partially balanced by counterweights attached to wire cable passing over sheaves and fastening to a structural bail at the boom end. This permits the discharge end of the boom to be lowered into the cars, so the coke may be loaded without excessive dropping and breakage; a motor-driven drum type car haul moves the cars forward as the loading progresses.

Small coke passing through the rotary grizzly travels over a high-speed, balanced shaking screen, having a screening surface 4 ft. by 6 ft. with ¾-in. round openings. The breeze passes through this screen and is delivered by a chute to cars on a track underneath the screening station paralleling the furnace coke track. The coke passing over the shaking screen falls into an 18-in. conveyor belt and is discharged into a chute arranged to deliver it onto the boom conveyor belt for mixing with the furnace coke, or as nut coke to cars on a track alongside the screening station.

For both the coal and coke handling plants all conveyors below yard level are carried on reinforced concrete beams and slab construction with reinforced concrete posts, and above yard level by steel galleries roofed and sheeted with corrugated galvanized steel. Decking under the conveyors is of steel plates and the floor alongside the conveyors on both sides is of reinforced concrete slab construction. All chutes and hoppers subject to excessive wear are composed of or lined with hard cast iron plates or manganese steel.

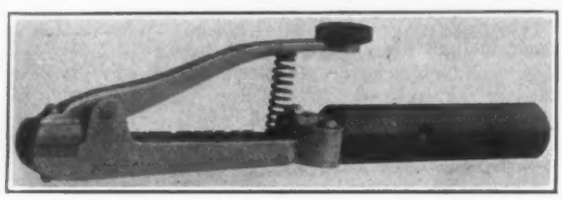
All troughing and return idlers for belt conveyors have roller bearings designed for grease lubrication, which has to be replenished only once every four to six months, thereby dispensing with labor for oiling. All conveyor head drives are of heavy design with gearing inclosed in oil-tight cast gear cases, high-speed bearings, ring oiled, with flexible couplings connecting motor armature shafts to the pinion shafts and with alinement couplings between the gear drive and the driven element. The control for the various conveyor drives is electrically interlocked, to start in sequence, which will prevent overloading or spillage at any one point by starting the succeeding conveyor first; and all conveyors of a system can be stopped simultaneously from push button stations.

(To be concluded)

Welding Electrode Holder

Outside cable connection and the high conductivity of the aluminum members, eliminating excessive heating, are features claimed for the welding electrode holder illustrated, which is being marketed by the Gibb Instrument Co., Bay City, Mich.

The weight of the device is 15 oz. The thumbpiece and handle are of fiber, the latter being air cooled. The spring is exposed as shown, and may be changed conveniently. Where the wire electrode is used to almost the end and an arc drawn on the holder, or in case of



Welding Electrode Holder. Outside cable connection is a feature

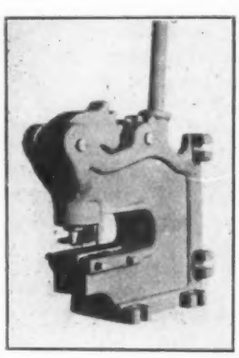
slippage of the wire and consequent arcing between the jaws, destruction of a holder frequently occurs. In the holder illustrated renewable jaws are provided for this contingency.

New Data on Uses of Cobalt

DeCourcy Browne, Inc., 120 Broadway, New York, has just received from its principals, Henry Wiggin & Co., Ltd., Birmingham, England, an interesting booklet on cobalt which deals with the sources, refining, commercial products, uses of its compounds in the ceramic industry, for paints, driers and enamels, its physical properties, for ferrous and non-ferrous alloys, including stellite, high-speed tool steel, magnet steels, etc. Henry Wiggin & Co. have been producing cobalt for over 60 years and therefore this booklet should be of more than ordinary interest. Copies will be sent on request.

Geared Lever Punch

A geared lever punch with a capacity for ⅜ in. holes in ¼ in. steel, and available with throat depths of 6 and 18 in. respectively, has been placed on the market by Ed J. Dreis & Co., San Francisco. The machine is adapted to No. 3 standard punches and dies.



In this machine the gear teeth are at different distances from the pivots, and the greatest pressure is applied to the punch when it enters the work and the least after it is through the hole. The punch is attached to the ram with a screw coupling which is self-centering and may be changed conveniently. The die is held in the steel bed plate, which is split part way and held by set screws on both sides. The machine may be mounted on a bench or post.

Angle steel may be punched within ½ in. of the flange from the outside face. Angles 1 in. and less may be punched close to the flange. Larger dies than 9/16 in. and irregular shapes up to 2 in. in diameter may be made to fit the machine. The weight of the machine with 6 in. throat is 130 lb. and with 18 in. throat 375 lb. The 6 in. machine is illustrated herewith.

The annual exhibit of evening work at Pratt Institute, Brooklyn, will be held Thursday evening, March 13, covering instruction to men employed in industry and engineering.

New Gage Records Impact Strains

The recording of strains produced in bridges by trains or motor trucks passing over them has been made possible by a new electric telemeter of strain gage developed at the Bureau of Standards of the Department of Commerce. The gage has two points which are clamped to the part of the bridge truss on which the measurements are to be made, and two stacks of carbon disks. A change of load on the truss causes a change in the distance between these points, and this is arranged to cause a change in the pressure on the carbon stacks and a consequent change in their resistance. The electrical apparatus for measuring and recording these changes can be placed at any convenient point, being connected to the gage by three wires, and the apparatus can be made to record very rapid changes. The recording apparatus can be used with several gages at once, as many as twelve gages having been so used with a single recorder.

This gage is described in Technologic Paper No. 247 of the Bureau of Standards, entitled "A New Electric Telemeter." Copies can be obtained at 5 cents each from the Superintendent of Documents, Government Printing Office, Washington.

Pedestal Forge of Pressed Steel

The pedestal forge illustrated, a recent addition to the line of the Buffalo Forge Co., Buffalo, although in-

tended for general repair work, is claimed to be especially adaptable to mine and other work where light weight and easy transportation are of advantage.

The forge is made up of a pressed-steel hearth and gear case, fan case and blast wheel, which are mounted on a small cast-iron pedestal, as shown. The forge may be screwed or clamped to a bench, table or pad. The hearth is of 14 gage metal, which is emphasized as providing light weight and eliminating breakage. The bowls may be nested for convenience in shipping. The sheet metal gear casing and openings for the bushings are die formed to assure interchangeability. Bushings are of steel. The blast wheel or fan is also of pressed metal and is 5½ in. in diameter. A round tuyere of cast iron with clinker-breaking valve and ash gate is part of the regular equipment.

The fire pan is 12 x 14½ x 2 in. The height overall is 19 in. and height of hearth 11 in. The weight of the forge is 26½ lb.

The New Jersey Zinc Co., Palmerton, N. J., has founded the New Jersey Zinc Company Research Fellowship in science and technology at the Lehigh University, Bethlehem, Pa., donating $15,000, the income from which will be paid to the holder of the fellowship. This is the first such fellowship of its kind to be established at the university.

Secretary Hoover Will Continue to Cooperate with Trade Associations

WASHINGTON, Feb. 19.—The Department of Commerce will continue to receive and publish information from trade associations. Announcement to this effect was officially made by the department last Saturday. It grew out of speculation as to what the policy of the department would be regarding this subject as the result of the recent correspondence between the department and the Attorney General relative to the legality of the collection, compilation and distribution by trade associations of statistics or general information. The Daugherty statement is held widely to place a severe restriction on the activities of trade associations, but it is clearly held that it would be legitimate for trade associations to compile and distribute through the department certain classes of general information. The question arose as to whether Secretary of Commerce Hoover would consider the Daugherty view so restrictive as to ask trade associations to cease cooperation with the department or whether the associations themselves would withdraw cooperation.

The announcement of the department makes it plain that it expects to continue to receive cooperation from trade associations, although it is known that several have quit supplying the department with statistics. The announcement said that "the department does not express any views as to the legal status of any association from which it receives the information, or any approval of its activities."

The statement declared that the department will continue to publish its monthly Survey of Current Business, in connection with which it has been receiving information and statistics from various associations.

Steel Jobbers to Meet at Rye, N. Y.

American Iron, Steel and Heavy Hardware Association will hold its next convention May 13, 14 and 15 at the Westchester-Biltmore Country Club, Rye, N. Y. George F. Greene, secretary-treasurer of the association, emphasizes that the association has never held a convention at New York and that Rye, being only 25 miles from downtown New York, provides many of the advantages of the New York location without the possibility of hotel congestion and at the same time furnishes excellent recreation facilities to fill in the time between sessions.

Boiler Manufacturers Meet in Cleveland

The annual winter meeting of the American Boiler Manufacturers' Association was held at the Hollenden Hotel, Cleveland, Feb. 12, with a large attendance of members. The meeting was presided over by E. R. Fish, St. Louis, president of the association, and the session was devoted mainly to the presentation of committee reports and discussions of these reports.

The cost accounting committee reported that it is working on a report that it will present at the annual spring meeting, in which will be outlined the cost accounting systems employed in plants of the three members of the committee, each engaged in a different line of boiler manufacturing.

The stoker-boiler committee in its reports suggested that members refer to it problems that come up in their contact with stoker manufacturers, the committee agreeing to try to work out these problems. An invitation was received from the Stoker Manufacturers' Association to hold a joint meeting with that association next fall. Action on the invitation will be taken by the executive committee.

The committee on steam heating boilers pointed out various advantages of steel boilers as compared with cast iron boilers and contended that the latter type should be used only for small installations.

The subject of standard setting height for boilers was brought up by the committee on smoke prevention and the sentiment appeared to be in favor of having standards adopted in city ordinances, taking the authority away from smoke inspectors. It is pointed out that when these regulations are in the hands of the smoke inspection department, a change is often made when a new smoke inspector is placed at the head of the department. The adoption of a standard setting height for boilers was referred to the committee with power to act in conjunction with similar committees of the Smoke Prevention Association and of the American Society of Mechanical Engineers.

The commercial committee made report on the thickness of pressed steel manhole plates for various working pressures and on a standard form for acceptance of jobs on boilers where the erection is a part of the boiler manufacturer's contract.

Frank D. Chase Addresses New England Foundrymen's Association

Frank D. Chase, president Frank D. Chase, Inc., Chicago, foundry engineer, was the guest of the New England Foundrymen's Association at its February meeting, held Wednesday evening, Feb. 13, at the Exchange Club, Boston. Mr. Chase confined himself largely to the design and laying out of foundries and the rapid handling of materials and products. Stress was laid on the continuous movement of product through the foundry, as well as the necessity of proper lighting. The general design of most of the foundries shown by Mr. Chase provided facilities for plant expansion whenever the business of the particular company warranted, without interruption of working schedules. In the discussion that followed Mr. Chase's address, much information regarding the distribution of light and ventilation, floor materials, etc., was obtained by the members of the association.

Some 75 members and guests attended the meeting, which was presided over by Norman Russell, president. Mr. Russell introduced R. F. Harrington, Hunt-Spiller Mfg. Corporation, Boston, vice-president, who gave a brief outline of the coming activities of the association. These activities include an address by Richard Moldenke, a day devoted to golf at the invitation of President Russell, and an inspection of the coke works of the Providence Gas Co., Providence, R. I. The New England representative of Frank D. Chase, Inc., was made a member of the association.

COMING MEETINGS

February

Southern Metals Trades Association. Feb. 26 and 27. Seventh annual convention at the St. Charles Hotel, New Orleans, La. W. E. Dunn, Jr., Atlanta, Ga., secretary.

April

American Association of Oil Burner Manufacturers. April 1, 2 and 3. Annual meeting. Hotel Chase, St. Louis. Leod D. Becker, 518 Bank of Galesburg Building, Galesburg, Ill., secretary.

National Metal Trades Association. April 23 and 24. Annual convention at the Hotel Astor, New York. Louis W. Fischer, Peoples' Gas Building., Chicago, secretary.

American Electrochemical Society. April 24 to 26. Spring meeting at Philadelphia. Dr. Colin G. Fink, Columbia University, New York, secretary.

American Gear Manufacturers' Association. April 28 to 30. Spring meeting, Lafayette Hotel, Buffalo. T. W. Owen, 2443 Prospect Avenue, Cleveland, secretary.

Society of Industrial Engineers. April 30 to May 2. Annual convention at Buffalo. George C. Dent, 608 South Dearborn Street, Chicago, general manager.

Long Wheel Base Electric Truck

A long wheel base truck rated to carry 5000 lb. and intended for full load capacity of bulkier goods than could be placed on the shorter wheel base model has been added to the line of the Terminal Engineering Co., 17 West Forty-fourth Street, New York.

The drive and handling features are the same as in the shorter model. The truck has four-wheel drive, each wheel being provided with a vehicle type motor inclosed in weatherproof cases. Steering by all four wheels is a feature claimed to permit of shorter turning radius than might be expected from a truck of this length, which has a wheel base of 91 in. The truck is carried on four full-leaf springs and wheels with solid rubber tires 20 x 5 in. Brakes of the internal expanding type are ordinarily provided on two of the wheel units, but the other wheels may be equipped with brakes if desired. The large wheels, individual drive and springs are intended to permit use of the

Long Wheel Base Truck of 5000-Lb. Capacity. Four-wheel steer permits of comparatively short turning radius. The machine is designed to be used with separate bodies

truck without construction of special runways, it being able to traverse cinder fill, snow and ice.

The machine is designed to use separable bodies, driving under them as they stand on legs, and picking up by means of four screw jacks operated by a motor of the same frame and characteristics as those used on the wheels. It is claimed these jacks will elevate the loaded body clear of the ground in 5 sec. to a height of 9½ in., though the load may be carried in a partially raised position if desired. Provision is made for slippage at top and bottom of jack stroke to avoid jamming.

The machine may be used as a tractor if required. The coupler is automatic, with release from the operator's position.

Complaint Against Manufacturers of Farm Machinery

WASHINGTON, Feb. 19.—The Federal Trade Commission has issued a complaint against manufacturers of and retail dealers in farm machinery because of alleged conspiracy by interfering with attempts of farmers' cooperative associations in the Atlantic Seaboard States, to purchase farm machinery on a cooperative basis. It is alleged that activities of the manufacturers and retail dealers, including more than 500 of the latter, cut off the sources of supply of the cooperative associations. An additional charge is that the associations of retail dealers have engaged in a combination and conspiracy with certain manufacturers to fix and maintain prices at which farm implement dealers would sell to farmers and to eliminate competition between members of the associations and non-members. Manufacturers named in the complaint are International Harvester Co., Chicago; Emerson-Brantingham Co., Rockford, Ill.; Moline Plow Co., Inc., Moline, Ill.; Deere & Co., Moline, Ill., and Oliver Chilled Plow Works, South Bend, Ind.

Domestic Manganese Ore in 1923

The shipments of high-grade manganese ore in the United States in 1923, according to preliminary figures compiled by the U. S. Geological Survey, were approximately 32,000 gross tons, valued at $894,000, or about $28 a ton, compared with 13,404 tons in 1922, valued at $455,160, or about $34 a ton. The decrease in average value appears due chiefly to the fact that of the high-grade ore shipped in 1923 a larger part than in 1922 contained only about 35 per cent of manganese, whereas most of that shipped in 1922 contained 45 to 53 per cent and therefore brought a higher price. Montana, as usual, shipped the largest quantity, about 22,000 tons.

The quarterly imports of manganese ore were as follows: first quarter, 17,445 tons; second quarter, 62,943 tons; third quarter, 82,025 tons; fourth quarter, 43,635 tons—a total of 206,048 tons. These are the smallest imports made since 1911 and are less than half those made in 1918, when the domestic production was nearly ten times as much as in 1923. In 1918 the production plus the imports amounted to 797,000 gross tons, compared with 238,000 tons in 1923.

The shipments of lower-grade ore in 1923 amounted to about 305,000 gross tons containing 10 to 35 per cent of manganese, and 855,000 tons containing 5 to 10 per cent of manganese. The apparent immense increase in the shipment of ore containing 5 to 10 per cent of manganese is due mainly to the fact that prior to 1923 the ore shipped from the Ottawa mine of the Montreal Mining Co., Wisconsin, was recorded as iron ore. The percentage of manganese in the ore shipped by this company has been increasing so much that in 1923 it became necessary to record these shipments as manganiferous iron ore, containing 5 to 10 per cent of manganese, instead of as iron ore.

Bookings of Steel Castings in January

WASHINGTON, Feb. 19.—The Department of Commerce announces that January bookings of steel castings, based on reports from principal manufacturers by companies representing over two-thirds of the commercial casting capacity of the United States amounted to 49,164 net tons, as against 41,098 tons in December. The following table shows the bookings of commercial steel castings for the past 13 months by 65 identical companies, with a monthly capacity of 96,900 tons of which 38,300 tons are usually devoted to railway specialties and 58,600 tons to miscellaneous castings.

	Total		Railway Specialties		Miscellaneous Castings	
Month	Tons	Per Cent of Capacity	Tons	Per Cent of Capacity	Tons	Per Cent of Capacity
1923						
January	100,605	103.8	47,879	125.0	52,726	90.0
February	90,152	93.0	39,845	104.0	50,307	85.8
March	143,564	148.2	76,409	199.5	67,155	114.6
April	90,968	93.9	39,610	103.4	51,358	87.6
May	89,493	92.4	38,788	101.3	50,705	86.5
June	84,878	87.6	42,773	111.7	42,105	71.9
July*	52,066	53.7	16,741	43.7	35,325	60.3
August	50,515	52.1	18,332	47.9	32,183	54.9
September	47,574	49.1	21,685	56.6	25,889	44.2
October	37,446	38.6	9,840	25.7	27,606	47.1
November	39,660	40.9	12,916	33.7	26,744	45.6
December	41,098	42.4	15,182	39.6	25,916	44.2
1924						
January	49,164	50.7	18,970	49.5	30,194	51.5

*Two companies with a capacity of 785 tons per month on miscellaneous castings now out of business.

Deterioration of Farm Machinery

WASHINGTON, Feb. 19.—Tens, and possibly hundreds of millions of dollars a year, are lost by American farmers from deterioration of farm machinery because of lack of shelter, according to a statement issued by the Research Bureau of the National Lumber Manufacturers' Association. Experts, it says, estimate that avoidable loss occasioned by idle farm machinery standing in open fields is perhaps equal to one-half of all the taxes paid by the farmers of the United States.

What Is Steel?—Another Answer

Explanation of Red Shortness When Rolled at Certain Temperatures—New Theories and Hasty Conclusions —Work of Henry M. Howe

BY DR. ALBERT SAUVEUR

I PRAY your indulgence if I confess to a feeling of gratification in having been appointed the first of these lecturers. It does not follow, however, that I am losing all sense of proportion and that I have an exaggerated idea of the little I have been able to contribute to our knowledge of iron and steel. Indeed, I fully realize how small were my claims to so great a distinction. I also realize that those entrusted with the task of selecting a lecturer were actuated by their knowledge of the long and intimate friendship which had existed between the leader we have lost and myself, and I thank them from the bottom of my heart and modestly take up my task.

The Work of Henry M. Howe

It would be most appropriate to devote this entire lecture to a eulogy of Henry Marion Howe and his work, but how short the time for so large an undertaking and how inadequate my qualifications!

On Aug. 28, Sept. 4, 11, and 18, 1875, a series of articles appeared in the *Engineering and Mining Journal* entitled, "What Is Steel?" With one exception these constitute the first professional paper of Henry Marion Howe. That was nearly 50 years ago, three years after being graduated from Harvard University. He was then but 27 years old and already his keenly inquisitive mind was actively at work. There is a touch of romance in this young metallurgist who, on entering his scientific career, destined to be so brilliant and so fruitful, on the very threshold of it seems to have selected as his motto "What is Steel?" Like a knight-errant of science he started on his quest for an answer to that question, a quest which was to last 47 years and which death only brought to an end. And while thus engaged how many wonderful messages we received from him, each one bringing us nearer to the goal!

That Howe should have been able to impart to others the totality of his knowledge may be doubted, while unfortunately it has not been possible for him to communicate to others the faculty he had of using that knowledge through his extraordinary power of cöordination. This is an irreparable loss. The bricks he has left us, but where is to be found the mason capable of adding with equal speed and skill to the harmonious structure which Howe was building?

In selecting for my lecture the same title as the one given by Howe to his early articles, I do not intend to convey the impression that I have the answer to that question; I merely desire to indicate that we are still following his footsteps. Howe's professional papers can be counted but their value cannot be estimated. They cover the entire field of the metallurgy of iron and steel and the study of the nature and properties of these important metals. [The author here mentions briefly Dr. Howe's principal contributions.]

While Howe studied every phase of the manufacture of iron and steel and contributed to its advancement, because of the quality of his mind, he was naturally attracted with greater force by the scientific aspect of metallurgy. The profound study he made of the constitution of iron-carbon alloys, of their microstructure and thermal treatment, of what is sometimes called the physics of steel and his brilliant discussions of these subjects will forever remain deeply engraved in our minds.

New Theories and Hasty Conclusions

Howe teaches us to beware of hasty conclusions. The claims so frequently and lightly made by some writers that they have proven their contention are seldom found in Howe's writings. He is not carried away by new theories to the extent of discarding all others. He gives to each the weight to which it is entitled and draws guarded and sound conclusions. It is excusable on the part of the exponents of new theories that they should be unintentionally biased. They of necessity wear glasses through which they perceive a universe in complete harmony with their conception. For some it is an amorphous universe, for others it is colloidal, while others still can see it only through space lattices. Again some claim it to be governed solely by the phase rule.

Outsiders, however, should not wear the same glasses. They should be receptive but not too credulous. We should examine new theories as a workman examines new tools and use them with discrimination, avoiding too hasty a discard of other tools. There was a time when no paper on metallography could be written without prefacing it by a description of the phase rule. No metallurgical phenomenon was to be explained without its help. When I published my "Metallography" in 1912, I was criticized by some for not having devoted my first chapter to the phase rule instead of leaving it for the last chapter.

Such criticisms are not made today, the phase rule having been given the place it should logically occupy in our metallurgical studies. And so it will be with colloidal theories, X-ray analysis, and other modes of investigation mental or physical devised by man's ingenuity. When we are told that the fuzzy lines of the X-ray spectrum prove the existence of ultramicroscopic crystals of alpha iron, and that the existence of these small crystals is the obvious reason why quenched steel is hard, we should listen attentively, but we should not too lightly accept the claim that the problem of the hardening of steel has been taken out of the realm of speculation by this new method of investigation.

THE first Dr. Henry M. Howe Memorial Lecture, inaugurated by the American Institute of Mining and Metallurgical Engineers, was delivered Tuesday, Feb. 19, before the annual February convention in New York. Dr. Sauveur, who is professor of metallurgy and metallography at Harvard University, Cambridge, Mass., was selected as the first lecturer partly because of his long association with and intimate knowledge of the work of Dr. Howe.

In describing briefly the results of some experiments conducted in the metallurgical laboratory of Harvard University, I trust I am not wrong in assuming that, should I succeed in adding a little to our knowledge of the metals in which Howe was so deeply interested, I shall in a way honor his memory. These experiments seem to establish the fact that thermal ranges of critical plasticity exist in some iron-carbon alloys. It does not appear that the existence of such ranges had been observed before, or at least not as clearly, as we have been able to observe them. This investigation forms part of the thesis presented by Dai Chin Lee for the degree of Doctor of Science. They were conducted by Dr. Lee with great skill and thoroughness.

Reduced Malleability of Ingot Iron

For lack of time, I am able only to give a brief outline of this investigation and to call attention to the most significant results.

Armco Iron: It is well known that the extremely pure iron known as Armco ingot iron exhibits signs of red shortness when it is attempted to work it in a certain range of temperature placed by the makers at between 800 and 1000 deg. C. This temperature zone of relative non-malleability may be strikingly revealed by a simple torsion test. The bar to be tested, Fig. 1, is placed in an electrically heated tube furnace, from which it protrudes at both ends. One end is firmly held in a vise, while to the other end, supported by passing through a hole in a plate, is attached a wheel and crank, affording a means of twisting it. The temperature of the middle of the bar is recorded by the couple and a potentiometer. From its maximum at the middle, the temperature of the bar decreases gradually in both directions, resulting in equal temperatures prevailing at equal distances to the right and left of the center. The bars tested were ¼-in. square, and twisting was applied at a uniform speed when the following temperatures in degrees centigrade were obtained at the middle of the bars: 600, 750, 830, 900, 910, 915, 930, 940, 980, 1000, 1020, 1050, 1100, 1200. A bar was also twisted at room temperature. In every instance the twisting was continued until fracture occurred.

The results obtained, Fig. 2, show that as long as the temperature of the middle of the bar did not exceed 900 deg. C. the twisting and final fracture took place in the middle. The beginning of the Ac_3 point in this iron was found to be at 910 deg. C. Below 910 deg. C. it is therefore alpha iron that we are twisting, and fracture takes place at or near the middle of the bar, that is, where alpha iron has been heated to the highest temperature. It follows that the malleability of alpha iron increases with the temperature being maximum at the highest temperature at which alpha iron can exist, namely, at about 900 deg. C.

This result was to be expected. As soon as the temperature of 910 deg. C. is exceeded, however, the middle of the bar is in the gamma condition, while at some distance in both directions the iron is in the alpha state. It will be observed that twisting occurs not at the center of the bar where the temperature is highest but at two places equidistant from the center and necessarily at equal temperatures and that rupture finally takes place at one of these places. We naturally infer that these portions of ready twisting must be near or at 900 deg. C.

Here two inferences are permitted: (1) Alpha iron at the highest temperature at which it can exist, namely, in the vicinity of 900 deg. C., is more plastic than gamma iron at 940, 980, 1000, and even at 1020 deg. C.; or (2) when iron undergoes its alpha-gamma transformation, it acquires a temporary plasticity which greatly exceeds the plasticity of gamma iron at considerably higher temperatures. In view of the very local character of the twisting and of other evidences, which lack of time does not permit me to describe, the second conclusion seems more likely to be the correct one. As the temperature of the center of the bar increases the critically twisted portions are located at increasing distances from that center. It will be noted that the plasticity of the gamma portion increases until it actually becomes greater than the plasticity of the portion undergoing allotropic transformation, but this condition is not reached before the temperature exceeds 1020 deg. C. At 1200 deg. C. the plasticity of gamma iron is very pronounced.

The mechanism of this preferential twisting may be described as follows, assuming the bar to have been heated at the center to 1000 deg. C.: Twisting occurs locally at two places equidistant from the center, where the iron is undergoing allotropic transformation and where the temperature therefore is in the vicinity of 900 deg. C. This twisting strengthens the twisted iron, which now resists further twisting, causing the gamma portion to twist. This twisted gamma iron being strengthened in turn and resisting further twisting, final twisting and fracture generally occurs at one of the two critically twisted portions. As the temperature increases, the twisting of the gamma iron becomes more pronounced. The great resistance to twisting of gamma iron between 940 and 980 deg. C. should be noted. The results of these experiments justify, I believe, the placing of the range of relative non-malleability or of red shortness in Armco iron at between 900 and 1025 deg. C., and the statement that this lack of plasticity is maximum between 930 and 1000 deg. C.

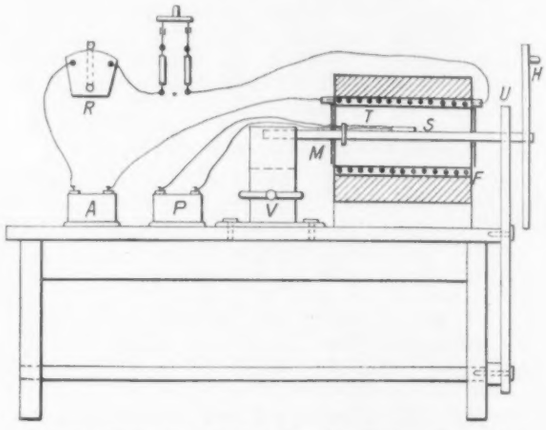


Fig. 1—Apparatus Used in Torsion Tests. One end of test piece is firmly held in a vise, *V*, while to the other end, supported by passing through a hole in *U*, is attached the wheel and crank affording a means of twisting it. The temperature of the middle of this bar is recorded by the couple *T* and potentiometer

These tests were repeated on falling temperature, that is, when portions of the bars equidistant from the middle were undergoing the Ar_3 transformation. This was obtained by heating the bars until the temperature at the middle exceeded by 50 deg. C. the desired temperature; the current was then shut off, and twisting applied as soon as the temperature desired was recorded. The point Ar_3 had been located in the usual manner at 890 deg. C. The results obtained agree with those resulting from twisting on a rising temperature. The critically twisted portions of the bars correspond closely to the Ar_3 transformation.

[The author then discusses similar twisting tests applied to electrolytic iron, Norway iron, low carbon steel, 0.30 per cent carbon steel, and stainless steel.]

Similarity of Low Carbon Steel

Having uncovered a range of reduced malleability in steel containing 0.10 per cent carbon apparently as wide as that which had long been known to exist in Armco iron, it will naturally be asked why the rolling and forging of low carbon steel is not attended with the same difficulty.

A tentative explanation may be offered. It is in the region of reduced malleability that the absence of sulphur is more likely to cause red shortness, unless counteracted by a sufficient amount of manganese. In Armco iron there is very little sulphur, to be sure, but there is also very little manganese. Even this extremely small percentage of sulphur in the nearly complete absence of manganese may result in red shortness in the zone of reduced malleability. Well-made low-carbon steel, although very much higher in sulphur than

Armco iron, always contains a sufficient amount of manganese to prevent red shortness in what might be called the critical working range. Hence, that range had never been discovered.

The following observations add much weight to the strength of this reasoning. When the sulphur content in Armco iron is less than 0.01 per cent, the metal can be rolled through the critical working range without any indication of red shortness in the practical absence of manganese, while if the sulphur is about 0.03 per cent it will likewise be possible to work through that range, provided the percentage of manganese is above 0.12 per cent. Impossibility of rolling while the metal is cooling through its range of reduced malleability without inducing red shortness results from the presence of sulphur not completely neutralized by manganese, and in the nearly complete absence of manganese, as in Armco iron, a very small amount of sulphur will suffice. Hence the ease with which we can roll low carbon steel while it cools through the range of reduced malleability and the difficulty attached to the same operation performed with Armco iron of usual composition.

Same Results Revealed by Tensile Tests

The existence of regions of critical plasticity in bars of iron and steel differentially heated may also be revealed by tensile tests, the bars being placed in a short tube electrically heated while being tested. It will suffice to present the results obtained with steel containing 0.10 per cent carbon and with Norway iron. Critical reductions of areas are obtained corresponding to the critical twists of the torsional tests, the bars finally rupturing at one of the critically reduced sections. So long as the temperature at the center of the bar does not exceed 850 deg. C. for the steel and 900 deg. C. for the iron, the bars contract and rupture at or near the middle, that is, where the alpha iron is at the highest temperature. On increasing the temperature at the center of the bars, critical reductions occur equidistant from the center, in all probability in the portions of the bars undergoing the A_3 transformation, their plasticity being greater than that of the gamma iron nearer the center, although the temperature of the latter is considerably higher. Critically reduced sections are still observed when the steel bar is heated at the center to 945 deg. C. Higher temperatures were not used for the tensile tests, although now the fracture has taken place in the center.

Summary

Twisting and tensile stresses applied to iron and steel bars heated at the middle to predetermined temperatures, the temperature falling gradually toward both ends of the bars, give the following results:

1.—In iron and in steel exhibiting an independent A_3 point, hence in iron and in steel containing less than some 0.40 per cent carbon, when the bars are heated in the middle to temperatures inferior to that point, they undergo twisting or contraction and final rupture near the center where the temperature was maximum.

When the bars are heated above their A_3 point into a range of temperature which in carbon-less iron covers about 100 deg. C. (from 900 to 1000 deg.), and under is gradually depressed and narrowed down as the carbon increases occurring between 770 and 800 deg. C. in steel containing 0.30 per cent carbon and being nil when A_3 merges with A_2, they twist or contract critically and finally rupture at some distance from the center where the temperature was that of the A_3 point. This zone of temperature may be termed "zone of relative non-malleability," or of "reduced malleability or plasticity."

When the bars are heated above that range they again twist or contract and rupture at the center where the temperature is maximum.

2.—In iron-carbon alloys which do not exhibit an independent A_3 point and, therefore, in alloys containing more than some 0.40 per cent carbon, critical twists or contractions do not occur, the bars always breaking in the middle.

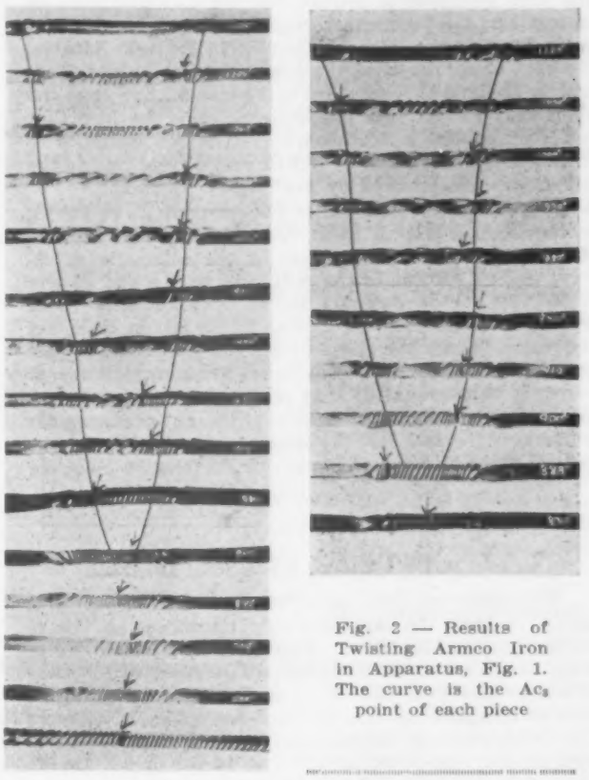


Fig. 2 — Results of Twisting Armco Iron in Apparatus, Fig. 1. The curve is the Ac_3 point of each piece

Engineering Body Revises Constitution

The revised constitution of the American Engineering Council permits the reelection of the president, an office now occupied by James Hartness, president Jones & Lamson Machine Co., Springfield, Vt. Another change is the dropping of the name "Federated American Engineering Societies" and replacing it by "American Engineering Council," which now stands for the association of societies. The administrative and legislative body, formerly called the American Engineering Council, is now designated the Assembly. The name of the executive board is changed to administrative board and the committee on procedure becomes the executive committee. By way of analogy it may be said that the constituent societies correspond to the States in our national government and, like them, have delegated certain powers to a national organization.

Among further changes is the provision for membership where it is made possible for technical sections or divisions of non-engineering organizations to be admitted to membership, as well as alumni associations of engineering schools and sections of non-member national societies, none of which seemed to be included under the original constitution.

The past-presidents are made members of the Assembly for six years following the expiration of their service as presidents. The old provisions regarding the setting up of State councils and relations to State affairs have been dropped. The membership is now restricted to organizations "of the United States."

F. L. Hervey, treasurer, and J. P. Smith, assistant treasurer, F. L. Hervey Co., Inc., Fall River, Mass., oak tanning leather, belting, etc., have purchased the Greenville Belting Co., Greenville, S. C., and have formed a new company to operate the plant under its original name.

BLAST FURNACES FOR BORNEO

Dutch East Indian Legislature Approves Project of Establishing Great Steel Industry on Poeloe Straits

The Peoples' Council of the Netherlands East Indies has just approved a project for the establishment of an iron and steel manufacturing industry in the Netherlands East Indies, Consul Charles L. Hoover, Batavia, reports. Upon receiving the approval of the States General in Holland this measure will become a law, and the plans may be put into execution at once provided that sufficient capital is forthcoming. The concession is to run until Dec. 31, 2000, or 76 full years, according to the agreement as approved by the Peoples' Council.

It is proposed to capitalize the company, to be known as the Borneo Iron & Steel Works, for gilders 70,000,000, of which the government of the colony is to receive gilders 450,000 of the preferred shares and gilders 19,550,000 of the common stock. Consequently there will be an investment of gilders 50,000,000 in cash, but the value of the ore deposits on the Island of Borneo and the coal mines on Poeloe Laoet are supposed to represent a value equal to that of the shares turned over to the government; that is to say, the government puts in its iron ore and coal deposits as two-sevenths of the capital stock of the company. In addition to claiming its proportionate share of the profits, the government requires a royalty for the ore and coal on a scale which begins with gilders 100,000 the first year and increases yearly until on the twelfth year it reaches the sum of gilders 1,000,000 and thereafter remains at that figure until the expiration of the concession.

Blast furnaces and rolling mills are to be located on the Poeloe Laoet Straits, on the mainland of Borneo, and must be capable of producing at least 150,000 tons of steel annually, comprising rails, shapes, bars, sheets, etc. The company is bound to sell these products in the most advantageous manner.

The amount of the Borneo iron ore available has been stated to be more than 100,000,000 tons, the ore body, which lies about 20 kilometers from the coast, having an average thickness of about 20 ft. The analysis of the ore, as stated by the Bureau of Mines at Batavia, is: Iron, 48 per cent; alumina, 10.40 per cent; silicic acid, 4.50 per cent; nickel, 0.50 per cent; chrome, 1.40 per cent; phosphorus, 0.08 per cent; and sulphur, 0.11 per cent.

There has been much unfavorable comment in the Java press regarding the quality of the coal produced on Poeloe Laoet. The Bureau of Mines has admitted the inferior quality of the coal obtained from the upper levels of this mine, but claims that the deep-lying veins are of excellent quality, although it has not committed itself with regard to the coking qualities of the coal obtained from them.

Trade with United Kingdom in 1923

WASHINGTON, Feb. 19.—The United Kingdom was again in 1923 the largest single purchaser of American export commodities. Exports to the United Kingdom amounted to $882,000,000, an increase of $27,000,000 over the year before, or 3 per cent, according to figures compiled by the Western European Division of the Department of Commerce. Imports were $404,000,000, an increase of $47,000,000, or 14 per cent. Among important increases in exports were copper, ingots and rods, which rose from $13,000,000 to $25,000,000; automobiles, from $3,500,000 to $6,000,000, and zinc, from $1,000,000 to $5,500,000.

British Pig Iron and Steel in 1923

Statistics have just been issued by the National Federation of Iron and Steel Manufacturers covering the pig iron and steel production of Great Britain in 1923 by grades. The data for pig iron are as follows:

British Production of Pig Iron by Grades in Gross Tons

	1920	1922	1923
Hematite	2,941,900	1,570,900	2,425,700
Basic	2,661,700	1,569,800	2,395,200
Foundry	1,457,300	1,165,700	1,772,300
Forge	605,000	277,600	417,200
Alloys	244,000	227,600	285,300
Other qualities	124,800	90,700	142,800
Total	8,034,700	4,902,300	7,438,500

The feature is the continued high percentage of basic iron being made, the 1923 percentage having been 32.2 per cent of the total. In 1913 it was only 24.6 per cent.

The data for the steel output, which at 707,400 tons per month exceeded the 1913 production of 639,000 tons, are as follows:

Production of Steel Ingots and Castings in Great Britain in Gross Tons

Process	1922	1923
Open-hearth, acid	1,680,400	2,522,300
Open-hearth, basic	3,624,300	5,270,700
Bessemer, acid	272,500	363,600
Bessemer, basic	196,000	137,400
Electric ingots	21,300	40,500
Electric castings	18,100	24,700
All other castings	68,000	129,700
Total	5,880,600	8,488,900

The steel ingot output last year was 825,000 tons larger than that in 1913, though it represents only a little more than two-thirds of the estimated steel ingot capacity of the country, says the London *Iron and Coal Trades Review*. There was a reduction of about 60,000 tons in the output of basic steel by the Bessemer process in 1923, while all other steel produced was larger than in 1922. There was a decided increase in the castings output, the respective totals for 1923 and 1922 being 154,400 tons and 86,100 tons respectively. Electric steel ingots last year exceeded 1922 by nearly 100 per cent.

British Pig Iron and Steel in January

LONDON, ENGLAND, Feb. 18 (*By Cable*).—January pig iron production was 631,500 gross tons, comparing with 629,900 tons in December and with 619,800 tons per month in 1923. The output of steel ingots and castings in January was 690,100 tons, exceeding the December record of 653,300 tons, but less than the average for 1923 of 707,400 tons per month.

Comparative production figures for the British steel industry in gross tons per month are as follows:

	Pig Iron	Steel Ingots and Castings
1913, per month	855,000	639,000
1920, per month	669,500	755,600
1921, per month	217,600	302,100
1922, per month	408,300	486,000
1923, per month	619,800	707,400
January, 1924	631,500	690,100

Quick Shipment to Alaska

WASHINGTON, Feb. 19.—A shipment of structural steel lining plates and vault doors weighing 12,800 lb. from Hamilton, Ohio, to Fairbanks, Alaska, in 25 days is believed to be the fastest time ever made in the transportation of freight from the United States to the interior of the Territory, says a special report received at the Department of the Interior.

The shipment went to Seattle and thence by steamship to Anchorage, where it was transported to Fairbanks over the Alaska Railroad. According to the report, it would have taken 60 days to deliver such a consignment of freight at Fairbanks prior to the construction of the Alaska Railroad by the United States Government.

The International Railway Fuel Association will hold its sixteenth annual convention at Chicago, May 26 to 29, inclusive. W. H. Harris, president W. H. Harris & Co., Chicago, has been appointed chairman of the local committee on arrangements, which held its initial meeting in Chicago on Feb. 8. Hotel Sherman was selected as headquarters for the convention and tentative plans were made for an exhibition of general railway supplies, coal, coke and oil.

Sharp Differences on Immigration Policy

Johnson Bill Will Be Strongly Advocated and Also Strongly Opposed—Secretary Hughes Makes Some Pointed Observations

WASHINGTON, Feb. 19.—Of the many conflicts of views in Congress, none of them with apparent partisan bias, one of the sharpest relates to the question of immigration legislation. Broadly, Congress has been divided into two camps on this subject to an even more pointed degree than ever before. The one group is known as the restrictionists, while the opposing side is known as the anti-restrictionists. Literally, the term applied to the latter group is not well taken. The so-called anti-restrictionists actually favor selective immigration and in this sense are restrictionists. The prevailing opinion is that the outcome of the diverse views on immigration legislation will be no new general law enacted at this session, but that the 3 per cent law, which expires on June 30, 1924, will be continued. There seems to be some likelihood that Congress may also adopt a measure looking to a more selective form of immigration.

The overwhelming sentiment not only in Congress, but throughout the country, plainly is in favor of a form of selective immigration. It is the purpose of Chairman Albert Johnson, of the House Committee on Immigration and Naturalization, to attempt to force through the committee bill after the House disposes of tax legislation. Mr. Johnson, representing the majority views of the committee, has reported a bill which reflects the attitude of the so-called restrictionists. Its outstanding feature, from an industrial point of view, is the proposal to change the immigration quota base from the census of 1910 to the census of 1890, and to reduce the percentage from 3 to 2, plus a minimum of 200 from each country.

Provisions of Immigration Bill

Preserves the basic immigration law of 1917.

Retains the principle of numerical limitation as inaugurated in the act of May 19, 1921.

Changes the quota base from the census of 1910 to the census of 1890.

Reduces the percentage from 3 to 2, plus a small base quota for each country.

Counts certificates, not persons.

Provides for preliminary examinations overseas.

Exempts wives, children under 18, and parents over 55, of American citizens.

Reduces classes of exempted aliens.

Places burden of proof on alien rather than on the United States.

Meets the situation with reference to admission of persons ineligible to citizenship.

Carries numerous sections to lessen hardships of immigrants.

Secretary Hughes Protests

There can be no question that Mr. Johnson's bill will find strong support in Congress, but likewise it will be vigorously opposed, and already has met with protests from Secretary of State Hughes, who charges that it sets up certain discriminations upon some foreign nations and he has especially objected to the amendment proposing the exclusion of Japanese immigrants. Mr. Hughes has given his views at length upon the request of Mr. Johnson himself, but the latter has strongly challenged the views of Mr. Hughes in a pointed statement attacking so-called professional leaders of foreign blocs, "aided by paid leaders of other groups which benefit from the continued arrival of aliens," it being charged that these groups are "boldly proclaiming that they have beaten the proposals for restrictive immigration legislation this year." Mr. Johnson declared that "they are gloating too soon," and added:

"The public, however, should understand that if Congress can be coerced by threats from these representatives of aliens to lay aside the pending restrictive bill, so that their followers may swarm into the country, the time will soon come when the people of the United States will have lost all control of their own affairs.

"This is an internal, domestic problem. It is a vital problem. It concerns the future of our country. It must not be controlled by foreign language newspapers and other alien influences. No threat of political sabotage to be worked by aliens in any State or against any political party can be permitted to defeat its consideration.

"The people of the United States must take hold of it and deal with it as it deserves to be dealt with, or they will see their American institutions fade and disappear under an avalanche of alien thought, alien purpose and alien power. America must be kept American. Perfection of restriction immigration laws must be accomplished now. Each year of delay makes action more difficult."

Mr. Johnson's Statement

Mr. Johnson issued his statement after a conference with President Coolidge, during which the Hughes statement is said to have been discussed at length. The assumption is that President Coolidge supports the views of Secretary Hughes, but that whatever counsel he may have given Mr. Johnson did not affect the views of the chairman of the Committee on Immigration.

The majority bill of the committee also has been attacked strongly in a minority report signed by Representative Sabath, of Illinois, and Dickstein, of New York, Democrats, who made particular attack on the provision to change the base year and lower the percentage. The minority report says that the effect of this change would be to reduce the number of immigrants to 168,083 against the annual quota under the present law of 357,803. On a 2 per cent basis calculated on the census of 1910, the minority report says the number of admissible immigrants would be 248,550, against 249,867, according to the census of 1920.

It is declared that there is an avowed reason for changing the basis of calculation to the census given 34 years ago, rather than the adoption of the normal basis of the census of 1920, or of continuing the basis of 1910. It is, the report says, to admit a minimum of immigrants from Eastern and Southern Europe and a maximum from Northern and Western Europe. Italy, for instance, could send only 4089, while the quota from Great Britain, North Ireland and the Irish Free State would be 62,658 and from Germany it would be 50,329.

Purpose of Discrimination

Discussing this feature of the proposed bill, the minority report says:

"The obvious purpose of this discrimination is the adoption of an unfounded anthropological theory that the nations which are favored are the progeny of fictitious and hitherto unsuspected Nordic ancestors, while those discriminated against are not classified as

belonging to that mythical ancestral stock. No scientific evidence worthy of consideration was introduced to substantiate this psuedoscientific proposition. It is pure fiction and the creation of a journalistic imagination. All we know is that these immigrants are all human beings and none of them is regarded by the majority of the committee as undesirable so long as he meets the test of the act of 1917."

At another point the minority report stated:

"The committee has failed in its entirety with regard to the serious labor problems affecting the South in view of the fact that last year alone 476,000 workers were drawn from the South into the manufacturing centers of the North. We are of the opinion that it is bound to create a greater and much more serious condition than the proponents of this legislation can perceive."

The Certificate Plan

Discussing the plan for the issuance of certificates to those planning to emigrate to the United States, the majority report says:

"The bill contains provision for enforcement of the numerical limitation not by counting immigrants upon their arrival, but by counting immigration certificates issuable at American consulates overseas. The plan, briefly, is to issue for each nationality a number of immigration certificates to be placed in the hands of intending immigrants as they obtain American visés upon their passports. Each certificate has a validity of two months to the time of taking ship. Therefore the intending immigrant, having obtained his passport, his immigration certificate, and his visé, is at liberty to proceed to the United States in the full knowledge that he will not be debarred solely by a quota limitation. He must, however, undergo further examination at the port of entry and be able to pass under the provisions of the 1917 act. It is expected that the number of those who cannot pass will be greatly reduced by reason of the preliminary investigation. There should be no arrival of excess-quota cases, and there need be no racing of steamships. If this bill reduces to the minimum the number of arriving aliens that must be turned back, it will have accomplished one of its important purposes."

The majority report declares that the committee has devoted much time to plans that would admit laborers and farmers. In this connection it says:

"The prosperity of the United States does not depend upon additional unskilled alien laborers coming to this country. Industry and activity have survived the slackened immigration caused by the European war and the quota law (the two covering a stretch of almost 10 years), and the United States has had one spell of great unemployment during that period. Our gain in population through natural sources is large—10,000,000 in the period 1910-1920. Some thought must be given to the welfare of the coming generations.

"Farming is declining. The number of farms is decreasing. The farm population is leaving for the cities. To pass a restrictive act, with an exemption for farmers and their families, is to defeat restriction. Farm organizations, labor organizations, the American Legion, and patriotic societies generally have declared by firm resolution for suspension or restriction."

Bethlehem Merger Hearings Resumed

There were no sessions last week of the hearings being conducted by the Federal Trade Commission in the merger of the Midvale Steel & Ordnance Co. with the Bethlehem Steel Co. Hearings were resumed Monday morning at the Federal Building, Broadway and Park Place, New York, the first witness being Philip Patriarche of the firm of Patriarche & Bell, steel jobbers, New York.

Lackawanna Plant Activities

BUFFALO, Feb. 19.—With the placing in operation Monday of the Lackawanna plate mill, this Bethlehem Steel Corporation subsidiary is now operating all of its mills. Nineteen open-hearths are operating out of 24 and seven out of nine blast furnaces are in blast. The Lackawanna is now producing 118,000 tons of ingots per month as against a normal of 135,000. Lackawanna officials say the outlook for sustained good or better operation is encouraging.

The completing of the installation of the motorized equipment for the blooming mill will take place in about six weeks.

Progress on the new coke ovens is satisfactory, foundations having been completed in both, with 60 per cent of the brick work on one battery and 40 per cent of the brick work on the other battery. Each battery is to have 57 ovens.

Lackawanna's housing program is also proceeding satisfactorily, residences having been completed for 22 families who have moved in, with as many more waiting for houses to be completed.

American Can Co. Earnings

Net earnings of the American Can Co. in 1923 were $10,983,094, after taxes and charges, as shown in the annual report. This is equivalent to $19.63 per share on the $41,233,300 of common stock, and compares with $18.30 in 1922. Profit and loss surplus was $37,570,780, as compared with $31,948,016 in 1922. Total assets came to $153,281,189, as against $145,750,147 in the preceding year. Part of the increase was in the valuation of plants and equipment, which was nearly $3,000,000 in excess of the 1922 figure. Working capital at the close of the year was $41,230,247, as compared with $37,069,792 for 1922. President H. W. Phelps said in his statement:

"Expenditures for new construction as predicted in the last annual report have exceeded those of 1922 and amount to $4,821,285. This sum represents additions to both buildings and machinery made necessary by growing business. The expenditures for this purpose in 1924 will probably exceed those of 1923."

Steel Car Companies Consolidated

The Pennsylvania Tank Car Co. and the Pennsylvania Car Co. have been consolidated under the name of the Pennsylvania Car Co. The personnel of both companies is retained and company affiliations remain unchanged. The announcement says: "With plants at Sharon, Pa., Kansas City, Kan., and Beaumont, Tex., the Pennsylvania Car Co. offers its patrons and patrons of the Pennsylvania Tank Car Co. complete car manufacturing and repair facilities."

Southern Railway Shops

BIRMINGHAM, ALA., Feb. 19.—In the construction of a locomotive erection shop and car works at its North Birmingham yards, the Southern Railway will take from the Virginia Bridge & Iron Co. more than 3740 tons of structural steel. The machine shop will be served with two 15-ton cranes, running its full length on an 80-foot way. The erecting shop will be served by one 150-ton overhead traveling crane and two 15-ton overhead traveling cranes running the full length of the building. The boiler shop will be served by a 20-ton crane and a similar sized crane will serve the smith and flue shops. The car shops will have two 15-ton cranes and two 20-ton cranes. The shops and works being placed will be the last word in construction and upward of $3,000,000 will be expended. Car building and repairing and locomotive repairing will be done for the Southern and Alabama Great Southern railroads. Dwight P. Robinson & Co., New York, are the engineers and contractors in charge.

Bill Favors Installing Diesel Engines

Rehabilitation of American Merchant Marine Planned, Through Operating Economies of Internal Combustion Motors—Tariff Discrimination

WASHINGTON, Feb. 19.—The shipbuilding industry of the United States, as well as American merchant marine circles, is hoping that the present session of Congress will enact the bill recently reported by Chairman Greene, of the House Committee on Merchant Marine and Fisheries, which authorizes the use of $25,000,000, from the construction loan fund of the merchant marine act of 1920, to equip Shipping Board vessels with Diesel engines. It is a question whether the bill will be enacted at the present session, although it has the strong support of the Shipping Board and, presumably, of President Coolidge.

It is maintained that the tremendous savings that would be brought about through conversion of the vessels to this comparatively new type of motive power would go far to aid in the elimination of losses sustained by present operations of Government-owned ships. It is also believed that the increased efficiency of the ships would greatly enhance their value and attract private purchasers and would be a long step toward disposal of ships by the Government and the establishment of a privately owned merchant marine. This in turn, it is pointed out, would obviously be of vast help to the iron and steel industry, shipyards, engine builders and the many other manufacturing lines providing material for ship construction, as well as proving of vast benefit to American commerce carried in American vessels.

Conversion of the ships to Diesel motive power has been given especially careful study by Admiral W. S. Benson, a member of the Shipping Board, who has prepared tables showing large reductions in the operating expenses and additional cargo capacity of ships propelled by Diesel engines, along with many other advantages. The committee also has been furnished with the following table by Harte Cooke, engineer of the McIntosh & Seymour Co., one of the pioneer manufacturers of Diesel engines in this country, which shows certain advantages:

	Shipping Board steam vessel	Converted to motor ship with steam auxiliaries	Converted to motor ship with Diesel-driven auxiliaries
Dead-weight tons	4,125	4,125	4,125
Average speed (knots)	8.5	8	8
Average tons fuel per day	[a]28	[b]8	[b]4½
Nautical miles a ton of cargo is carried for each cent expended for fuel	43	93	165

[a] Coal.
[b] Oil.

It is not the intention of the committee to permit the expenditure of this money for the conversion of the ships, estimated at about $400,000 each, unless the vessels are to be actively engaged in foreign service, and this is explicitly stated in the bill. It would be used under the condition that the Shipping Board have either a customer for the converted ship, or a term charter for the ship of not less than five years.

The bill amends two sections of the merchant marine act of 1920. In the first section, the construction loan fund, which now amounts to about $66,000,000, was set aside for loaning purposes to owners desiring to build new ships. It is proposed in this bill to extend that principle to cover conversion of ships as well as their construction. In the original act the Shipping Board was allowed to loan under mortgage up to two-thirds of ship costs, while in the new measure provision is made for a loan of 50 per cent on either ship or installation of motor, and an additional loan up to two-thirds of the cost, provided adequate additional security is given.

To show the development of the motor ship, the committee quoted from the Liverpool *Journal of Commerce*, which stated that during the past year more than 100,000 tons of new shipping built were of the motor type, of less than 400,000 tons in all. Germany holds second place in the number of motor vessels built. On the basis of present shipbuilding, Great Britain's position at the end of 1924 will be one of real dominance in motor-ship-building. The committee report adds:

"Recently the British Government granted a loan of $10,000,000 to the Royal Mail Line for two fast motor ships and another loan of $8,000,000 to the Bank Line toward the conversion of 19 motor freighters. Judging from these reports, it can be seen that the various maritime nations are rapidly recognizing the great importance of encouraging the economies of this new type of propulsion, and each is striving to be the first to obtain the carrying trade under competitive conditions, which fact is likely to make the older types of coal and possibly oil vessels unprofitable."

Members of the Senate also are making moves looking to the upbuilding of the merchant marine. The subject grew out of consideration being given to a pending commercial treaty with Germany, which, Senator Robinson of Arkansas says, will give the Senate an opportunity to establish a new merchant marine policy. It relates to the right to impose discriminating duties on imports carried in American ships. Provision for lowering tariff rates on goods carried in American bottoms is made in a section of the Jones merchant marine act of 1920, but this never was put into operation by the executive department. The State Department has opposed it on account of alleged international complications and the prospects of retaliation.

President Wilson declined to make the section operative and President Harding took the same attitude, and it is reported that President Coolidge is disinclined to put the section into force. It would require abrogation of about 26 commercial treaties. Senator Fletcher of Florida is in favor of enforcing the section and said that, if President Coolidge persisted in the policy followed by Presidents Wilson and Harding, Congress would be asked to annul the "most favored nation" clauses by special statute.

Standardization of Forged Tools

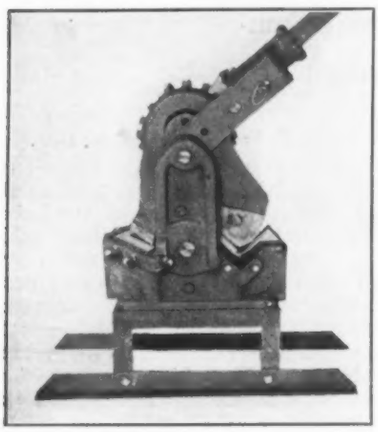
Reference was made in THE IRON AGE, Feb. 14, page 500, to the program of the Forged Tool Society for standardizing forged tools. On page 533 of the same issue was a later Washington dispatch announcing adoption of the program by the Division of Simplified Practice, Department of Commerce, and with revised figures in the number of types of tools considered. The 549 tools are reduced in number by 33.5 per cent, and 365 recommended to be retained as general practice. This percentage reduction, however, is by no means uniform. The number of bars is more than cut in half, while the reduction in number of wedges is less than one-fifth. The tools covered are as follows:

Recommended Simplification Forged Tools

	Before Simplification	Recommended to be Eliminated	Recommended as General Practice	Elimination Percentage
Picks, mattocks, hoes	72	23	49	32
Bars	67	38	29	57
Wedges	83	16	67	19
Sledge and heavy hammers	164	57	107	35
Anvil and blacksmith tools	163	50	113	31
Total	549	184	365	33.5

Angle Shear and Notcher

An angle shear and notcher having a capacity for angle bars 2½ x 2½ x ¼ in. has been placed on the market by Ed J. Dreis & Co., San Francisco.



As shown in the accompanying illustration, the shearing-off cutters are on one end of the machine and the miter die on the other. They are always in position for working and do not require setting up, which is of particular advantage perhaps where the men are not familiar with setting dies. The flange on the side of the cam has notches for the ratchet pawl, and operates in either direction.

Three operating speeds are provided: Direct action for ⅛-in. angle bars; ratchet for 3/16-in., and compound action for ¼-in. bars. These are obtained by withdrawing the pin with the loop, which leaves the geared handle part pivoted, the gear engaging and moving the ratchet one notch with each stroke. The heavy angle bars are said to be cut with a few strokes and tee bars sheared by making two cuts. The ends of the bars are not deformed in shearing.

The notching end of the machine may be employed for mitering angles for square bending, tapering off ends, cutting out one leg at the end of bars, and other uses. The weight of the machine is 400 lb.

Sur-rebuttal in Pittsburgh Base Case

WASHINGTON, Feb. 19.—Sur-rebuttal testimony by the United States Steel Corporation in the Pittsburgh base case will be presented before Examiner J. W. Bennett of the Federal Trade Commission beginning March 5. It is expected to conclude this evidence, which will mark the final testimony by March 8 in this long drawn out proceeding. It is reported that the sur-rebuttal will consist largely of statements and summaries of documents already in the record.

The report by Examiner Bennett is to be made to the commission by March 17. The brief for the commission is to be filed by May 10, while the reply brief of the Steel Corporation is to be filed by May 25. Arguments will be begun on June 9.

Creditors Will Manage Standard Tank Car Co.

A committee of creditors will handle the affairs of the Standard Tank Car Co., Sharon, Pa., for the next five years, according to an official announcement made last week.

J. Bruce Orr, a Pittsburgh attorney, has been named president to succeed John Stevenson, Jr. The new organization took over the plant Feb. 14. John Stevenson III, treasurer; Daniel Stevenson, vice-president, and E. A. McDonald, secretary, retire in favor of members of the new organization, who represent the largest creditors. The new board of directors includes L. F. Payne, representing the Carnegie Steel Co.; R. F. Holmes, the Westinghouse Air Brake Co.; William Robinson of Pittsburgh, H. C. Rorick of Toledo, E. Clarence Miller of Philadelphia and J. P. Whitla of Sharon.

The creditors have agreed to accept five-year notes for the amount of their claims, payable 20 per cent yearly. John Stevenson, Jr., who has more than $700,000 interest in the plant, has agreed to accept five-year notes. All bank loans outstanding and creditors' claims under $5,000 will be paid immediately.

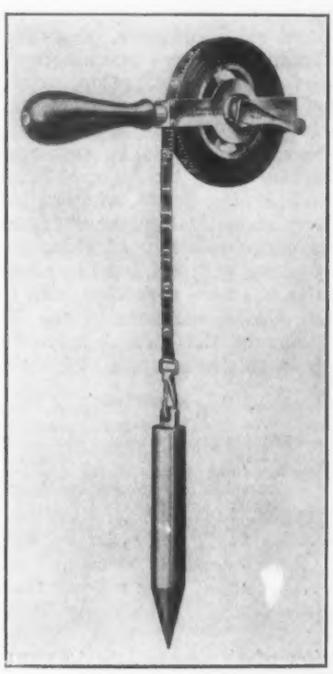
The new management is confident the obligations can be liquidated in five years and at the end of that period it will revert to the original ownership. The company has about $2,000,000 orders on the books and plans are being made to start operations at an early date.

Problems of Foreign Trade Discussed

WASHINGTON, Feb. 19.—The first comprehensive tour of the kind undertaken by the Department of Commerce was begun last week, when a detachment of four division chiefs of the Department left for New England industrial cities in response to invitations from the chambers of commerce or export associations in Bridgeport, Conn.; Providence, R. I.; Springfield, Worcester and Boston, to address those bodies in public conferences on problems of foreign trade. The members of the delegation are R. A. Lundquist, chief of the Electrical Equipment Division; W. A. Rastall, chief of the Division of Industrial Machinery; H. H. Morse, chief of the Specialties Division, and Grosvenor Jones, chief of the Division of Investment and Finance. Mr. Lundquist will speak on "Competitive Electrical Merchandise Abroad," Mr. Rastall on "Marketing American Machinery in India," Mr. Morse on "Formulating an Export Policy" and Mr. Jones on "Credit Conditions Abroad."

Steel Tape for Gaging Heavy Oils

The reel tape shown in the illustration, intended for the gaging of extra heavy oils, is a recent addition to the line of the L. S. Starrett Co., Athol, Mass.



The steel tape ribbon is unusually heavy, ½ in. wide, and is mounted in a nickel-plated metal frame. The drum is cored for lightness and a long winding handle is provided to assure increased leverage and in turn make the tape quick and easy to operate. The winding handle is hinged to fold to the right or left, making it possible to lock the tape at the desired length, the knob folding against the frame, a feature emphasized as of particular advantage when the heavy plumb bob is attached. The bob is nickel-plated and has tapering point, as shown. It is 1 in. in diameter, 6¾ in. long and weighs 18 oz. The tape is 50 ft. long and is graduated in feet, inches and eighths of an inch. The handle is hard wood and of a size to permit full grip.

Railroad Improvements in Colombia to Be Financed by Panama Canal Payments

WASHINGTON, Feb. 19.—It is estimated that from $4,000,000 to $5,000,000 will be spent for rails, construction tools, equipment and other railroad material in Colombia during the next two years, it having been decided to use a large part of the Panama Canal payments for the purpose of building and improving railway lines, says Trade Commissioner Carlton Jackson, Bogota, in a report to the Department of Commerce. Manufacturers in the United States in the last 10 years have received a large share of the rail business, with a percentage going to British and Belgian producers.

CONTENTS

February 21, 1924

ESTABLISHED 1855

THE IRON AGE

EDITORS:

A. I. FINDLEY WILLIAM W. MACON GEORGE SMART

C. S. BAUR, *General Advertising Manager*

Member of the Audit Bureau of Circulations and of Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

F. J. Frank, *President* PRINTED IN U. S. A. George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Charles G. Phillips, *Vice-Pres.* A. C. Pearson, *Treas.* F. J. Frank, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: 425 Park Square Building. Philadelphia: 1420-1422 Widener Building. Cleveland: Guardian Building. Detroit: 7338 Woodward Ave. Cincinnati: First National Bank Bldg. Buffalo: 883 Ellicott Square. Washington: 26 Jackson Place, N. W. San Francisco: 320 Market St. London, Eng.: 11 Haymarket S.W.1.

Subscription Price: United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50; Foreign, $12.00 per year. Single copy 25 cents.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

To Improve Foreign Trade Service

THE Consular Service of the United States, despite the interference of spoils politicians, has rendered admirable service for many years and will always be a strong arm of the Government, particularly in maintaining the rights of American citizens in foreign lands, but as a business agency for improving and extending the foreign commerce of Americans, the Service is far from satisfactory.

This fact was recognized a number of years ago, and one of the important steps taken toward the improvement of the foreign trade service was the sending abroad of commercial attachés and trade commissioners by the Department of Commerce. These officials had no statutory standing, but on account of the thorough work which they did they were allowed to continue by sufferance from year to year. Annual appropriations were made for their support, but they naturally felt the insecurity of their positions. For this reason their efficiency was not so great as it would have been had Congress established their positions by statute. To remedy these conditions, a bill introduced in the House of Representatives by Mr. Winslow aims to put the foreign commerce service in the Bureau of Foreign and Domestic Commerce on a permanent basis. It is a measure of great importance and is essentially right, although some of the details of the measure may require amendment.

In the recent hearing before the House Committee on Interstate and Foreign Commerce, Charles Lyon Chandler, representing the Chamber of Commerce of Philadelphia, who was formerly in the consular service and also served later as a trade commissioner, said that over a million dollars' worth of actual business for American firms was brought to American firms through the efforts of the trade commissioner in the Union of South Africa during the past three years. Mr. Chandler suggested that if a man who is paid $5,000 can obtain a million dollars' worth of business and other men can render similar service for like compensation, the Department of Commerce is getting a large number of valuable and highly trained officials at a ridiculously cheap figure. Manifestly, men who can obtain such results will not continue permanently in the service of the Government without increase of compensation. Reasonable salaries are provided for by the Winslow bill, which we believe will receive the hearty support of the business men of the country and should be passed without unnecessary delay.

Commodity Price Relations

SINCE the war the post-war trend of commodity prices has been a subject of great importance. The average of all prices, representing substantially the purchasing power of the dollar, has been regarded as marking inflationary or deflationary tendencies. Price relations between commodities were greatly changed, but we were so full, immediately after the war, of the "readjustment" idea that even now, more than five years after the war, there is a disposition to expect prices to come together, when we should recognize that there are other influences. General trends may occur, not related to war or readjustment.

The argument has not died out, whether or not prices in general may return to the "pre-war level," but there has been little regard to the point as to what "pre-war level" may mean. The relatives most commonly used take 1913 prices as the basis, but the selection is merely a convenience. It does not mean that 1913 was a particularly trustworthy year. We have paid considerable attention to the interesting coincidence that prices fell after the war of 1812 and after the Civil War for approximately the same length of time, 30 years; hence we say that prices may fall for 30 years after the World War. We do not similarly stress the statistical fact that prices rose for 18 years or thereabouts before the Civil War and before the World War. Whether or not one is disposed to assign a reason for it, prices have shown a tendency to rise, apart from the influence of war.

As a mathematical fact, and not for the purpose of making an argument, it may be stated that, on the basis of the Bureau of Labor's wholesale commodity index, the rise from 1896, the low year, to 1913, was 49.6 per cent, representing an average annual increment of 2.4 per cent, while from 1913 to 1923 the advance was 54 per cent, or an average annual increment of 4.4 per cent. If the previous rate, shown from 1896 to 1913, had continued, the average relative for 1923 would

have been 127, based on 1913 as 100, while the reported average for 1923 is 154.

As to price relations between groups of commodities, a comparison can be made by observing the trends before the war and the trends shown since. While the Bureau of Labor has added individual commodities from time to time, has changed the weighting as new census reports became available, and has changed the basis for its relatives, its nine general groupings have always represented the same classes of commodities, farm products, food, cloths and clothing, etc. As first set up, the index numbers took average prices in the ten years 1890 to 1899 as 100, and this system was carried through 1913. Recent presentations have taken 1913 as 100. Thus we can compare trends before the war with trends shown from 1913 to 1923. The nine groups of commodities make quite different showings.

As the average of prices increased both before and after 1913, we shall for brevity call a failure of a group of commodities to advance as much as the average, a lag, and an advance more than the average, a gain. Then we have the following presentation:

Lag both before and after 1913: Metals, drugs and chemicals, and "miscellaneous."

Gain both before and after: Building materials and fuel and lighting.

Gain before, lag afterward: Farm products.

Lag before, gain afterward: Cloths and clothing.

Stayed with procession: Food.

While we should not generalize for the purpose of adopting a belief, the following statements may be made: Food kept step with the average. Farm products got ahead and then dropped back. Cloths and clothing fell behind and then caught up. Drugs and chemicals, metals and miscellaneous exhibited a persistent tendency to lag. Building materials and the group fuel and lighting showed a persistent tendency to run ahead.

With such distinct divergences, it seems unreasonable to expect these groups ever to return precisely to their former relations. If so, a return of the average to any former level would hardly be more than an arithmetical accident.

Better Mailing Week

CARELESS addressing of mail matter, the Post Office Department finds, makes an annual toll of $1,740,000. Incomplete, inadequate or incorrect addresses are found in overwhelming amount in the mail matter coming from large patrons of the mails. In an effort to reduce the waste, Postmaster General New has designated the present as "Better Mailing Week." Business houses are requested to have antiquated mailing lists brought up to date. The department has offered to furnish its own clerks to help in the correcting at a charge of 60 cents an hour.

At one time the proposal was made to Congress to place a one-cent charge upon each letter requiring directory service, thus attacking the problem through the pocket book of the mailer as the only means of solution. It is estimated that 200,000,000 pieces of mail are yearly given the so-called directory service, which means that postal employees must take time from the regular handling and dispatching of mail in the endeavor to provide correct addresses. In New York alone the cost of this service approximates $500 daily. For the lack of a return address nearly 20,000,000 of these are sent annually to the Dead Letter Office.

THE IRON AGE hopes its passing on to the reader of the plea of the postal authorities will help in eliminating delays in the transmission of communications. It gave a page in its Annual Review Number, Jan. 3, in the advertising section, to the Government's request for street addresses. The important thing is for business houses to put precise addresses not only on letterheads and envelopes but on all advertising matter. The time has passed when any air of importance may be attached to an establishment because the designation on its stationery of the city alone appears sufficient to locate it.

Better Furnace Refractories

A WIDE field of usefulness in the development and improvement of refractories for steel and non-ferrous furnaces is open to the American Ceramic Society. An auspicious beginning was made at the society's convention, reported elsewhere in this issue.

An important hindrance to progress in open-hearth furnace development, particularly in the case of the newer high-temperature or blow-torch types of furnaces, is the difficulty in securing refractories which will withstand the temperatures. Unfortunately, this phase of the subject was not discussed at the Atlantic City meeting. With proper brick linings the life and output of certain furnaces can be increased and the need for larger capacity diminished. The problem is not one of stronger brick to sustain wall and other pressures. Refractories are an obstacle also to progress in certain electric steel and brass furnaces. And in the older types of steel furnaces, better refractories would decidedly increase efficiency.

Whether improved linings will come from different modes of manufacture or from different forms of brick or from the discovery of new materials, natural or synthetic, remains to be worked out. As for a neutral brick, the perfection of such would be a boon. Cooperation between the technical men of the ceramic organization and practical men, both makers and users of brick, ought to be prolific of much good.

Compulsory Physical Examinations

IN communities where compulsory physical examination of workers has been established in one or more of their industries, it has come to be accepted as a matter of course, without prejudice. There is also more or less appreciation of the truth that it is of greater benefit to the employees than to the owners. From the economic viewpoint the practice has proved eminently successful, for various reasons, probably more suc-

cessful than even its original proponents expected.

Compulsory physical examination has weeded out the men and women suffering from contagious and infectious diseases. It has proved an important factor in accident prevention, in discovering workers inherently incapable of performing tasks likely on that account to be hazardous. In this and other ways it has assisted in the placing of employees where their labor is most efficient for themselves and for their employers.

Works medical departments, having a knowledge of the physical condition of each man or woman, can advise intelligently as to the treatment of ailments and weaknesses. Eye strains are relieved by proper placing in employment or by oculists' prescriptions. Those who should not suffer heavy lifting or strains of a physical or nervous nature are protected by being given tasks suitable for them.

The exclusion of labor because applicants for work fail to measure up to requirements physically has proved to be small. It is ordinarily reckoned variously from 2 to 6 per cent, though it may be higher in some plants where the bulk of labor requires great physical strength and endurance. But on the whole it is not a great factor in the life of a community. It is pointed out, moreover, that a large part of those rejected would not stay at work were they hired, because their health would not permit it.

The life extension phase of compulsory physical examination is being watched with deep interest. The purpose is to give periodic examinations to all employees, that weaknesses which may develop during employment, whether because of it or not, may be detected in their incipiency, if possible, and measures taken to correct them, perhaps by treatment, perhaps by transfer to other tasks. The institution of health oversight offers large opportunities for practical philanthropy. It has been found an important factor in preserving a high shop morale, but industry would like to have more testimony on this point than it has yet received. There is something also to say as to savings to the employer, for in large plants it is a matter of no small magnitude to maintain the required routine.

The Iron Age and Its Readers

What a liking we United States Americans have for steel! Not only did we consume per person last year 855 lb., or nearly 2½ lb. a day, but the per capita consumption was 2.3 times more than that of Great Britain, 3.1 times more than that of Germany and 3.4 times more than that of France. These facts were available at a glance from an article in THE IRON AGE of Feb. 14 on foreign trade in iron and steel.

One of the charts left no doubt as to the large proportions of the British iron and steel exports but showed that while the grand total of Great Britain was twice that of U. S. A., we shipped a larger tonnage than did that country in wire products as well as in semi-finished steel and structural steel.

Commercial and economic facts also were given in the same issue, valued especially from the standpoint of the authorship. One article, devoted to conditions governing in the manufacture of steel sheets and answering questions constantly arising in buyers' minds, was contributed by a man not now connected with the business and accordingly it does not suggest any discounting, such as the reader more or less unconsciously applies to statements from a possibly ex parte source.

Another article, with the authority of Vice-President George E. Roberts of the National City Bank, New York, analyzes facts bearing on the immediate future of prices. There is no intention, however, to continue to enumerate what a single issue contained, but instead the foregoing has been set down in the spirit of a little mutual congratulation (not forgetting the responsibility involved) that we are able regularly to secure, in addition to the staff efforts, such a wealth of information directly and indirectly affecting industrial progress.

Record Railroad Freight Traffic

TOTAL freight traffic for 1923 amounted to 457,589,846,000 net ton-miles, which makes a new record in the history of American railroads. This exceeds by 2.3 per cent, according to figures of the Bureau of Railway Economics, Washington, the total for 1920, which held the previous record. It represents an increase of 21.7 per cent over the traffic of 1922, and an increase of 4 per cent over that of 1918, when the tremendous stimulus of the war had its fullest effect.

A new high record was made in 1923, also, in the average daily movement per freight car, with 27.8 miles per day. This exceeded by 1.7 miles the best previous average—that for 1917. The average load per freight car was 27.9 tons—an increase of one ton over the 1922 average, but a decrease of 1.4 tons under the figure for 1920, which was the greatest for any year on record, being 29.3 tons.

In ton-mile units, the average freight car use in 1923 amounted to 776, or 86 per cent of the goal of 900 units represented by the desired movement of 30 miles per day and loading of 30 tons per car. Corresponding figures for 1922 are 632 ton-miles per car and for 1920 735 ton-miles per car.

All in all the remarkable performance of the railroads is one in which all may take pride, but few probably will look upon it as a strong argument of itself for heavy buying in 1924 of rolling stock and motive power equipment.

Temperatures in Charcoal Furnace Practice

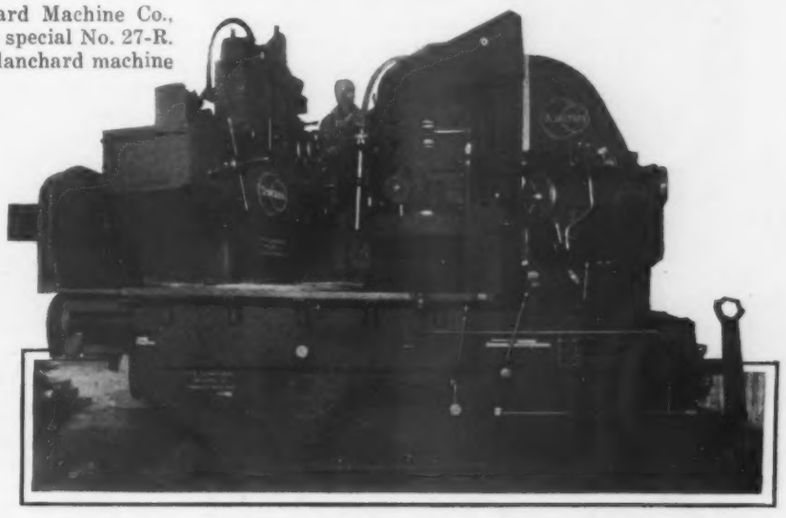
In a study of temperatures encountered in charcoal iron furnace practice, being conducted by the Department of the Interior at the Minneapolis experiment station of the Bureau of Mines, samples of charcoal and slag have been obtained from four charcoal iron furnaces for determining the amount of sulphur in the fuel and that carried off in the slag. The results of these analyses will be incorporated into a report comparing the sulphur which is present in the materials used in charcoal and coke furnaces and the temperatures which are attained. Due to the relatively small amount of sulphur in charcoal little attention is given to the quantity of this element in the raw materials.

Heaviest Surface Grinder Is Used for Machining Baseplates

What is believed to be the heaviest and most powerful surface grinder so far built is the machine shown in the accompanying illustration, which will be used for finishing directly from the rough castings the various bosses and pads on both sides of cast iron base plates measuring 42 by 67 in. overall.

The size of the machine may be noted from a comparison with the man and the small surface grinding unit standing on the rotary chuck. The weight of the large machine is 43,000 lb. The wheelhead, which contains a 60 hp. motor and slides vertically on the column, weighs 7000 lb. complete with 36 in. grinding wheel, this being considerably more than the entire weight of the small machine. The head of the larger machine, although of unsual weight, is claimed to be so accurately controlled through feed gearing that the work may be ground to size within plus or minus 0.001 in. if desired.

The machine, built by the Blanchard Machine Co., Cambridge, Mass., is designated as the special No. 27-R. It is somewhat larger than the 27-R Blanchard machine



Surface Grinding Machine Weighing 43,000 Lb. Employed in Finishing Directly from the Rough Castings the Various Bosses and Pads on Both Sides of Base Plates. The latter are of cast iron and measure 42 by 67 in., overall. The machine carries a 36-in. grinding wheel and a 60-in. magnetic chuck, with an extension ring 76 in. in diameter added to it. The base of the machine is of one piece, weighs 11,800 lb. and forms a tank holding 500 gal. of cooling compound

described in THE IRON AGE of April 27, 1922, which carries a 27-in. grinding wheel and either a 48- or 60-in. diameter magnetic chuck. The machine illustrated carries a 36-in. grinding wheel and a 60-in. magnetic chuck, with an extension ring 76 in. in diameter added to it. The waterguards have also been widened, the base of the machine lengthened and other minor changes made so that work 84 in. in diameter may be swung for grinding. The 60-in. chuck is of the company's one-piece steel construction, the body of the chuck being machined from a solid steel forging, and having no joints from the working face through to the coils. Four speeds are provided for the rotation of the chuck, these being obtained through a sliding gear speed box. Heat-treated alloy steel gears are used and forced lubrication is provided to all bearings in the box. Important or continuously running bearings have either bath or forced lubrication, and there are a minimum of oiling points.

The base, which is of one piece and weighs 11,800 lb., forms a tank for 500 gal. of cooling compound which is pumped to the inside of the wheel and to the outside nozzle by a centrifugal pump with a 2½ in. discharge pipe. The chuck is traversed by power from the loading to the grinding position. Part of the waterguards move with the chuck and table, so that as the chuck moves out after grinding the work, the outward motion of the table provides part of the opening for removing the work. Full width of opening of the guards is obtained by swinging one section around the corner on suitable tracks. In unloading there is ample clearance for handling the work by crane.

The large wrench seen at the right in the illustration is for the bolts and bushings on the three-point column support, and is provided for maintaining proper alinement of the spindle. The machine seen on the chuck of the large machine is the company's No. 10.

The floor space occupied by the machine is 8 ft. x 15 ft. 9 in.

British Empire Steel Corporation Plants Resuming After Strike Settlement

The representatives of the coal miners of Nova Scotia and of the British Empire Steel Corporation have signed a new agreement for one year, retroactive to Jan. 16 of this year, and as a result the coal miners have returned to work. The new agreement will expire Jan. 15, 1925, and provides for the following increases over the rates in effect on Jan. 15 last: Datal men underground, 30c. per day; datal surface men, 25c. per day; shooters and loaders and contract men, including helpers, 7c. per ton; handpick miners, 8c. per ton; local contractors 6 per cent. It is estimated that the increase will involve an addition to the payroll of the 12,000 miners of the corporation of more than $1,000,000 a year. In addition the price of domestic coal to the miners is increased from $2.25 to $3.60 per ton.

As a result of the settlement of difficulties between the mine workers and the corporation, the Sydney, N. S., steel plant, which has been shut down for several weeks on account of the coal situation, will immediately resume operations and the blast furnaces which have been banked for some time will be put into commission at once. The open-hearth furnaces which were allowed to go cold will be relighted and the work of making rail steel with which to roll the 56,000-ton rail order for the Canadian National Railways, will be commenced as quickly as the furnaces can be made ready for production. Other departments of the Sydney steel plant will be put into commission as soon as trade conditions warrant. About 3000 men will resume work at the steel plant as a result of the agreement reached.

Domestic sales of oak leather belting in January as reported by the Leather Belting Exchange which represents about 60 per cent of the total product amounted to 436,774 lb., valued at $749,068, or an average of $1.71 per lb. These figures compare with 320,547 lb., $558,393, and an average of $1.74 per lb. in December, and with 517,636 lb., $928,122, and an average of $1.79 per lb. in January, 1923.

Examinations are announced for agricultural engineer at $3,000 to $4,500 per year and for Field Reclamation Commissioner in the Department of the Interior at $6,000 per year. Full information and application blanks may be obtained from the Civil Service Commission, Washington.

Production of portland cement in January is reported by the Geological Survey at 8,788,000 bbl., compared with 7,990,000 bbl. in January last year. This is the largest January production in the history of the industry. Shipments in January are given as 5,210,000 bbl., compared with 5,628,000 bbl. a year ago.

Melting Pot with Automatic Control

An electric pot in two sizes, 150 lb. and 750 lb. respectively, for melting and maintaining at working temperature soft metals and alloys such as solder, babbitt, lead and zinc, is being marketed by the Westinghouse Electric & Mfg. Co., East Pittsburgh. Thermostatic control automatically keeping the temperature of the molten metal at any point between 450 deg. and 950 deg. Fahr., is a feature. A small electric motor controlled by a thermostat throws the snap switch on or off as the temperature of the metal reaches the high or low limit set by the operator, and an even working temperature is assured without further attention.

The heating element and all its connections are mounted on the melting crucible, which can be easily lifted out of its outside casing to make the element accessible. The outside casing surrounding the crucible is lined with heat insulating material to reduce radiation losses and assure cool shop conditions. The control panel, which may be mounted in any convenient position, consists of magnetic contactors and suitable relays for opening and closing the line circuit. An instrument panel, shown in the illustration, which is set up adjacent to the pot, contains the thermostat with temperature regulating pointer, the push button switch for turning the current on or off, and a red signal lamp which serves as a warning in case the heat is left on accidentally.

An advantage claimed for the electric melting pot is that it permits the use of lead base babbitt rather than the tin base alloy, with a reduction in the cost of babbitting.

Pittsburgh Comment on the Renewal of Agreement with Miners

PITTSBURGH, Feb. 19.—Renewal of the present agreement between the Union Coal Mine Operators in the so-called central competitive field with the United Mine Workers of America for a period of three years agreed upon at the conference in Jacksonville, Fla., today, is viewed in various ways in the coal trade here. It is difficult to understand why the operators should pledge themselves to the maintenance of wage scales for such a long period in view of the fact that very few of them are able to produce coal profitably at today's market quotations in competition with the non-union mines, many of which are being operated today at the 1917 wage scales, which roughly are about $2 per day for day labor less than the union rates. It is believed that the union operators acquiesced in the agreement in the thought that only by demonstration of this sort could the union leaders be convinced of the burden their demands impose, not only upon their own membership, but the public and the operators. It is figured that union mines cannot operate at all fully and that a great many of them will be closed down through inability to continue without profits.

The opinion is expressed that a good many mines will cease operations at an early date and that if the men then want to go to work it will be on a wage basis governed by the current price of coal. In the past few months a large number of mines in western Pennsylvania and West Virginia have become non-union under such a condition. So much non-union coal has been opened up that there is a supply sufficient for more than 70 per cent of the average requirements of the country. With the signing of the new agreement there of course will be no strike or suspension of union mines. The danger to future supplies comes rather in the fact that, freed from troubles in the union mines, the union leaders will be in a position to concentrate on the non-union fields in an effort to bring about the unionization which was attempted, but was not particularly successful, in 1922.

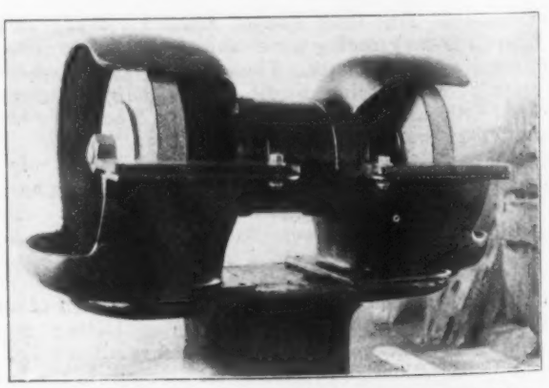
Tool Grinder with Special Motor

A model No. 106 tool grinder, the feature of which is the method employed for keeping the motor cool, has been placed on the market by Forbes & Myers, Worcester.

A disadvantage of having motors inclosed in a dustproof frame has been that it keeps the heat in. Usually it has been necessary to provide an inclosed motor larger than an open-air cooled motor of the same power, in order to prevent it from becoming too hot. In the grinder illustrated it is claimed that the advantages of both types of motors are combined. The motor is fully inclosed, protecting the bearings and electrical windings from dust and grit.

Two fans, located on the spindle just inside the bearings, blow a current of air across the ends of the winding. Upon passing the winding the air strikes the end of the grinding wheel guard next to the motor, which extends over the winding. The guards are of aluminum, which is a good conductor of heat. In this way the heat of the motor is carried from the windings to the guards and carried by the aluminum throughout the area of the guards, from which it passes to the air of the room. This is claimed to give as nearly as large a power capacity to the motor as it would have if open to the dust and grit of the room.

The motor has been designed for the particular tool illustrated without consideration of other applications, and is made longer and of smaller diameter than usual, in order to permit of maximum projection of the wheels in front of the motor. It is ¾ hp., of the squirrel cage induction type, for 2 or 3 phase, 25, 40 or 60 cycle current, and for any voltage under 600. The ball bearings are packed in grease, which is of sufficient quantity for a year's use. The wheels are 10 in. by 1½ in., and run at 1800 r.p.m. on 60 cycle current. The spindle is 1 in. in diameter at the wheels, and wheel flanges are 5 in. in diameter.

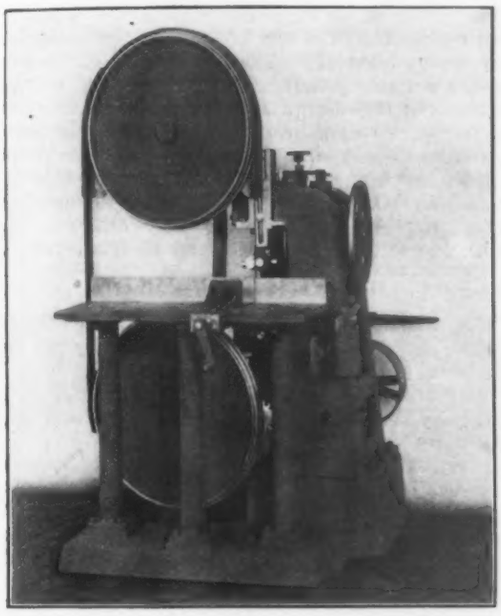


Tool Grinder With Motor Inclosed and Special Provision for Keeping It Cool. Fans on the spindle blow air across the ends of the winding. The air strikes the aluminum wheel guards and is conducted to air of the room

Following is adjustment of molders' wages prior to the turn of the year, the H. B. Smith Co., Westfield, Mass., has granted an increase in wages of all employees exclusive of members of the molders' union. The new minimum wage is 50¾c. per hr., with no bonus, as against 44½c. per hr., with a 5c. bonus. Higher paid employees have received a corresponding wage increase. Approximately 800 employees benefit by the new scale.

Band Saw for High-Speed Metal Cutting

The band saw illustrated, which is being marketed by the Stockbridge Machine Co., Worcester, Mass., has been designed to cut all kinds of metal and under varying conditions. Fine adjustment of the pressure of the teeth of the band against the work is a feature, and this, when set, is automatic in its operation. Previous designs are said to have been disregarded and machine tool standards to have been maintained throughout. Three sizes of the machine for cutting up to 12-in. rounds or squares are available. Although primarily designed to cut from the bar, the machine is adaptable to a variety of work, including shells, piping, beams and angle iron, and under working conditions it is claimed that disks have been cut within 0.005 in. for parallelism. The blades used are 1/32 in. thick.



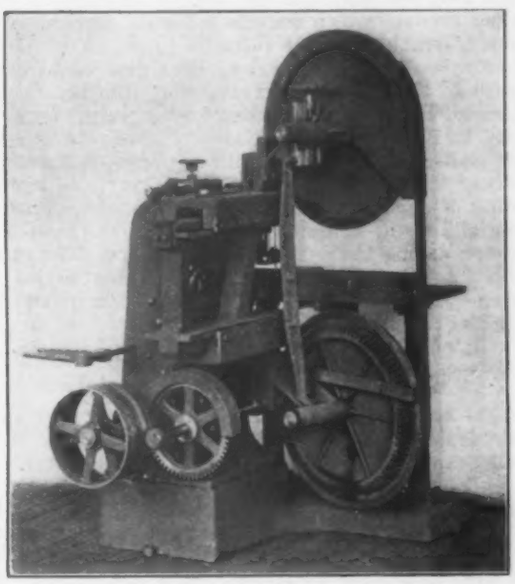
Metal Cutting Band Saw in Which Adjustment of Pressure of Teeth of Band for Varying Conditions Is a Feature. Three sizes, to cut up to 12 in. rounds or squares, are available. The blades used are 1/32 in. thick. Disks have been cut within 0.005 in. for parallelism

The machine, which is designated as the H & R, is made up of a base on which is mounted the column and work-support table, as shown. In the column a carriage, or ram, slides on scraped ways, the disk wheels being carried on the carriage and moving with it. The band travels vertically and is carried between two sets of guide rolls located directly above and below the work. The top rolls are adjustable up and down for different sizes of stock. The rolls are square with the ram.

Gravity weights are attached to the ram, and these if used alone, would move the ram forward and keep the band against the work at a constant pressure, regardless of the kind of material or the cut to be taken. Further provision has been made, however, for pressure control. A wheel on the right-hand side of the column, shown in the front-view illustration, moves with the movement of the ram, by means of a gear and rack arrangement. The friction pad bearing against the surface of this wheel is intended to control, by means of the balancing weight, the feeding of the ram forward and the pressure of the saw blade against the work. The position of the weight determines the amount of feed to the ram or the speed at which it moves forward. Thus between the gravity weight pull on the ram, and the friction, a balanced pressure control is provided without elaborate mechanism. An automatic stop may be set to stop the feed at any point of the stroke.

Ample wearing surfaces are provided for all moving parts of the machine. The fixed guide rolls are carried on roller bearings and the tension guide rolls on ball bearings. Guide rolls are hardened and ground. Self-oiling bearings are provided for the band wheels and special attention is said to have been given to placing of oil and grease cups. A tension screw carried in a slide that is pivoted serves to keep the band taut and in alinement when in use. Either belt or motor drive arrangement may be provided.

The Arrangement of Base, Column, Work Table, Ram and Disk Wheels May Be Noted From Rear View Below



The machine is built under the Houghton & Richards patents.

Exhibition of Pastel Paintings Made in Iron and Steel Plants

Roderick D. MacKenzie, an artist whose home is in Mobile, Ala., has been at work during the past two years almost continuously in making pastel paintings of iron and steel plants. A writer in the *American Magazine of Art* speaks of Mr. MacKenzie's success in painting wild animals in India and of his Delhi Durbar picture for the government of India and adds:

"Because of his intimate knowledge of movement and his consummate skill in transferring into pigments on canvas his impressions, MacKenzie has caught here what is even more subtle than animal action, that of fire and heat. Riotous color, hot, living flames, vibrant parching atmosphere, these combined to show the beauty in strength, the majesty of work, the wonderful in daily tasks, and the picturesque in gigantic masses of structural substance in the process of being made useful for man—these are his pictures."

Night after night, week after week and month after month, Mr. MacKenzie worked in the plants and has produced a series of 45 pictures, begun and finished on the spot, which will be on exhibit at the Anderson Galleries, Park Avenue and Fifty-ninth Street, New York, Feb. 19 to March 1, daily from 10 a. m. to 6 p. m., except Sunday, when the exhibition will be from 2 to 5 p. m. Joseph Pennell says such a series has never been attempted before and is enthusiastic in its praise.

Operations at the plant of the National Tube Co., Lorain, Ohio, are at an approximate 90 per cent basis. One blast furnace has been blown out and some coke oven capacity has been put out during the last week. Both are expected to be put back into operation within a month or six weeks.

Refractories for Steel and Brass Furnaces

Open-Hearth Brick Discussed by American Ceramic Society—Proper Linings for Electric Brass Furnaces

IN connection with the twenty-sixth annual convention of the American Ceramic Society, held at the Hotel Traymore, Atlantic City, N. J., during the week Feb. 4-9, the refractory division held several interesting sessions which were in the main devoted to consumers' problems in the refractory field. The morning session on Wednesday, Feb. 6, was devoted to papers entitled, "The Method of Selecting Refractories for Marine Purposes of the United States Navy," by Lieut.-Com. H. H. Norton, U. S. Navy; "Factors Affecting the Resistance to Abrasion of Silica Lining Block for Coke Ovens," by E. N. Magee and F. A. Harvey, and an interesting discussion of the use of high alumina brick for lime kiln by R. F. Geller. There was considerable discussion among the refractory men on all of these papers, with the result that the entire morning period was given over to them, necessitating the rearrangement of much of the program devoted to a symposium on open-hearth refractories and brass furnace refractories.

Electric Brass Furnace Refractories

The afternoon session was opened by a paper on the electric brass furnace refractory situation by H. W. Gillett and E. L. Mack, presented by the latter. Because of the limited amount of time available and the length of the program it was necessary for Dr. Mack to confine his remarks to an extemporaneous abstract of a rather lengthy paper, but the main points touched on were illustrated by lantern slides so that very little was lost through the necessity of abbreviating the presentation of the paper.

It was pointed out that electric brass furnaces are of three types, each of which presents some refractory problems of its own, as well as some which are common to all types.

The Baily Furnaces

The first type considered was the granular resistor type, typified by the Baily furnace in which the source of heat is a granular carbon resistor contained within a trough supported on piers above the furnace hearth. In this type the heat reaches the metal indirectly by reflection from the roof. In order to secure a sufficiently high rate of energy input to enable the furnace to melt metal in competition with other types it is necessary to carry the resistor at such a high temperature that there is only one refractory available which will stand up under the severe service. This refractory is carborundum and even with this design there is sometimes very little margin between the resistor temperature and the decomposition point of carborundum due to the fact that resistor elements of this kind are very prone to develop hot spots resulting in severe refractory damage. The service imposed on the roof in this type of furnace is severe, but not to any such degree as that imposed on the material composing the resistance trough. In order to avoid refractory troubles at this point the furnace is powered much lower than considerations of thermal efficiency and low melting-cost would dictate, with the result that the furnace is largely able to hold its own in competition with the other types in common use.

The designers of the Baily furnace have recognized that a problem existed here and this is indicated by the fact that a new design is now being placed on the market in which it is planned to raise the power input of the furnace several fold with the idea of bringing the efficiency of the furnace up to a point where it will be comparable with that obtainable with the other familiar types. Naturally this will increase the refractory problems to an equal degree, but it is planned to accept this or rather to attempt to offset it by altering the design of the furnace by providing for the easy replacement of that portion of the furnace carrying the resistor trough and its supporting refractory. Furnaces of this design are just being put into service, but no service data are available, and it is too early to predict to just what degree the problems connected with this type of furnace will be solved by this change in design. The furnace has inherent advantages for certain applications and it is very desirable that a solution of its refractory problems be found if possible.

Detroit and Booth Furnaces

The second type of electric brass furnace discussed was the moving indirect arc type, typified by the Detroit and Booth furnaces. In this type the heat is radiated directly from an arc to the metal contained within a refractory lined, cylindrical shell. Oscillation or rotation of the furnace on its horizontal axis gives a very thorough stirring of the metal and effectively prevents super-heating and consequent loss of volatile zinc vapor from the surface under the intense radiation of the nearby electric arc. The application of this principle to electric brass melting is due to engineers of the Bureau of Mines who have worked out this design in laboratory furnaces in connection with an investigation of the prevention of metal loss which has been in progress for the past ten years.

The conventional lining for furnaces of this type is a highly aluminous brick of the general type of corundite or superafax and the major refractory problems involved may fairly be said to be solved. The furnace melts red or yellow brass equally satisfactorily, common practice giving 2,000,000 lb. of metal melted per lining. Such refractory problems as do exist are minor ones, among which may be mentioned the possibility of using one-piece linings in smaller sizes of furnaces, the development of close fitting refractory pieces in the hope of preventing melted seepage into the refractory lining and the development of a refractory designed to prevent the peculiar eroding action of zinc vapor on the roof portion of these furnaces.

This type of furnace has found extended use in foundries and rolling mills, and is in use for melting a variety of metals, including yellow brass, red brass, nickel silver, aluminum bronze and bearing alloys, as well as gray cast iron.

Induction Furnaces

The third type of furnace considered was the induction type, typified by the Ajax and the new General Electric. In this type the heat is generated within the metal itself, the design being such that a vertical loop or ring of the molten metal is made the secondary of the electrical transformer. The lining of this type is either a pre-formed refractory of the corundite type or more commonly a rammed-up lining of an asbestos fire-clay mixture of the general type of the Johns-Manville asbestos cement.

Linings of this type are thoroughly satisfactory for melting yellow alloys under 75 per cent copper in which the operating temperature will not commonly rise above 1150 deg. C. The average life of 600 tons of metal melted can easily be obtained in practice and occasionally life of as high as 3000 tons has been reported.

The high thermal efficiency of the furnace and the absence of electrodes gives this furnace an advantage over the other types and it would be very desirable if its use could be extended to the melting of the high copper alloys and leaded alloys met with in the foundry. The temperatures met with in this service, however, are

of the order of 1350 deg. C., and impose conditions which the asbestos cement lining has not been able to meet satisfactorily.

The authors considered this a problem of first magnitude and believed that the attention of both refractory producers and furnace designers should be focused upon it to as great a degree as possible. The manufacturers believe, however, that suitable refractory materials are at hand and that the question is largely one of design which will work itself out in time, or which will be worked out as a result of the comprehensive program of development which they are now carrying out. Certainly progress is being made and equally certainly there is room for much more progress in this line. However, if it does not come, it will be safe to predict that the brass melting field will divide itself between the induction furnace working on yellow brass, mainly on 16 or 24-hr. service, and the indirect arc furnace melting the high-copper alloys either in daylight or continuous melting and on the short schedules of miscellaneous alloys in the jobbing foundries.

In the discussion of this paper E. L. Crosby, Detroit Electric Furnace Co., gave a brief account of the experience of his company in the development of refractory materials for its furnace and called attention to the fact that the situation at the present time was very satisfactory, the lining life of the furnaces being about 1500 heats. He hoped to see progress made along the lines of one-piece refractories for furnaces of this type and urged the cooperation of members of the Ceramic Society in work along this line.

(*To be concluded*)

Cold Working of Metals

During the past month questions in connection with the effect of temperature of rolling upon the hardness changes induced by cold deformation of metals have received considerable attention by the Bureau of Standards. Zinc was rolled at a temperature of —15 deg. C. The specimens were kept in a freezing mixture of salt and ice except while being passed quickly through the rolls at a temperature of from zero to —2 deg. C. The low temperature did not affect the general form of the scratch and Brinell hardness curves, but the material itself became more brittle with initial deformation than has usually been found to be true. Work in connection with the determination of the density changes of copper after cold rolling is being continued.

Death of Richard Trimble

Richard Trimble, for many years secretary and treasurer of the United States Steel Corporation, died Feb. 18 after a long illness at his home, 1020 Madison Avenue, New York. Mr. Trimble had not been at his desk since 1921, when he was stricken with paralysis. He was born in New York, March 26, 1858, and received his A.B. degree at Harvard in 1880. After graduation he made a trip around the world with Robert Bacon, a classmate. Another classmate was Theodore Roosevelt. Upon his return, he engaged in the cattle business in Wyoming for several years. He then became connected with the steel business and was treasurer of the Federal Steel Co. at the time it was merged with the United States Steel Corporation in 1901, and was made secretary and later treasurer and director of the new organization, which position he filled until April, 1922, when he resigned on account of ill health. He had also been treasurer and director of the Minnesota Steel Co. for a number of years prior to that date, and was a director of the Elgin, Joliet & Eastern Railway Co., the National Tube Co., the Tennessee Coal, Iron & Railroad Co., and the Union Steel Co. Mr. Trimble had long been treasurer of the Roosevelt Hospital, New York, succeeding his father, and the service of the two covered a period of 56 years. He was a close friend of the late J. Pierpont Morgan. He is survived by his wife, a son, Richard, Jr., who is a student at Harvard, and two daughters. He was a member of the American Iron and Steel Institute and numerous clubs.

RICHARD TRIMBLE

A Steel Corporation official who was associated with Mr. Trimble for many years said of him Tuesday: "Richard Trimble was a man of marvelous ability and spotless character. He was absolutely intolerant of anything dishonorable in business. He was devoted to numerous charities and was personally extremely generous."

Southern Railroad Issues List

WASHINGTON, Feb. 19.—A list totaling more than 100 items and including machine tools, forging equipment, punches and shears, heating furnaces, pumps, boilers and other equipment for use at Birmingham, Ala., was issued today by the Southern Railway System. The list follows:

One 42-in., one 30-in., two 24-in. and four 18-in. geared-head heavy duty lathes
One 16-in. and one 12-in. tool room lathes
Two brass lathes
Two 3-in. steel head turret lathes
One 3-in. turret lathe
One turret lathe for 7-in. bar work
One 34-in. turret lathe
One 36-in. vertical turret lathe
One 30-in. vertical turret boring mill
One 54-in. standard boring mill
One No. 1 plain milling machine
One No. 2 universal milling machine
Two 24-in. horizontal milling machines
One sensitive drill press
One 30-in. plain drill press, belt drive
One 48-in. radial drill
One 16-in. patent head engine lathe
Two 36-in. and one 32-in. heavy-duty planers
Three draw-cut shapers
One 600-ton driving wheel press
One 48-in. carwheel boring mill
One double punch and shear
One 48-in. single end punch
One 48-in. throat single punch
One 48-in. single end shear
One 48-in. throat single shear
One 3500-lb. and two 1500-lb. single-frame steam hammers
One 500-lb. Bradley hammer
One 3½-in. forging machine
One bolt heading machine
One 4-spindle nut tapper
One 6-spindle staybolt machine
One bulldozer
One locomotive guide bar grinding machine
One locomotive piston rod grinder
One heavy-duty power cold saw
One internal link grinder
One twist drill grinder
One wet tool and one dry grinder
One buffing machine
One ⅜ to 4-in. pipe threading machine
Five electric rivet heating furnaces
Five rivet heating oil furnaces
One oil heating furnace for hammer work
One oil heating furnace for forging machine
One driving box boring machine
One flue welding machine
One 24-ft. flue tumbling machine
One flue roller
One plate planer
One plate furnace
One set plate bending rolls
Four water-tube boilers
Four stokers
Four soot blowers
One 2500-ft. steam-driven air compressor
One 1500-ft. and one 1000-ft. electric air compressors
One 500-gal. steam-driven horizontal underwriters' fire pump
Two outside packed boiler-feed pumps
One hydraulic power pump
One open boiler-feed water heater
Two motor generator sets
One d.c. steam engine generator
One switchboard complete

Iron and Steel Markets in Europe

Continental Competition Still Hurting England—Germany Afraid of French Dumping—Franc Exchange Makes Situation Unsettled

(*By Cable*)

LONDON, ENGLAND, Feb. 19.

IRON and steel markets here are somewhat disorganized by the dockers' strike, coupled with fresh depreciation in franc exchange. Business is difficult to negotiate; consumers generally are holding aloof. There has been some domestic pig iron buying in anticipation of increased prices. Cleveland producers are reducing output, one furnace already being banked and another transferred to ferromanganese. Continental competition is still keen, but domestic makers are handicapped by high costs.

Hematite is dull, supplies exceeding demand. Foreign ore is inactive, only odd cargoes changing hands; higher freights are hindering fresh orders. Sellers of Bilbao Rubio ask 24s. to 24½s. ($5.16 to $5.27) c.i.f. Tees. North African hematite is held at 22s. to 23½s. ($9.46 to $10.10) c.i.f. Tees.

Finished steel is dull. Export demand is moderate but Germany is reported to be securing contracts from India and South America. Continental inquiries having disappeared, export quotations are easier. The Yorkshire Engineering Co., Sheffield, has secured orders for six locomotives for the Nitrate Railroads.

January exports of pig iron, excluding ferroalloys, were 39,128 tons, which includes 9775 tons to the United States. Total exports of iron and steel were 337,724 tons.

Continental position is dominated by the decline in franc rates and prices are difficult to name. Works generally seem disinclined to give way, but the future is uncertain. Recent bookings have been heavy, but little business apparently is passing through traders here. Merchants have sold merchant bars at £7 7¾s. (1.42c. per lb.) c.i.f. India, for April and May shipment. About 30,000 tons of iron and steel has been delayed in shipment from Antwerp, owing to transport congestion at that port.

In the Ruhr the following furnaces now are blowing: Deutsch-Luxemburg Bergwerks & Hütten, 3; Bochumer Verein, 3; Gelsenkirchener Bergwerks, 3; Rheinische Stahlwerke, 4; Gutehoffnungshütte, 3; Phoenix A. G., 5; Thyssen & Co., 5; Hoesch, 3; Krupp, 4; total, 33 out of 84.

Tin plate demand is improving, and the minimum price is being talked up, owing to dearer tin. Makers are asking fully 24½s. ($5.27) basis IC, f.o.b. Fair business is being done on the basis of 24¼s. ($5.21) IC, f.o.b. There is good demand for wasters and stocks are declining.

Galvanized sheets are dull. Last week an inquiry from Argentina for 40,000 tons was reported.

Black sheets are stagnant, including Far Eastern demand.

GERMAN UNEMPLOYMENT SERIOUS

Price Competition with France Active—Export Trade Balance Favorable

BERLIN, GERMANY, Jan. 28.—While employment is again increasing, the home steel and iron markets are almost entirely dead, and competition has reached dimensions not witnessed since before the war. The improvement in general business began with the textiles industry late in December. On Jan. 1 there were still 1,528,000 fully unemployed in unoccupied territory, but since Dec. 1 the number of men working short hours has fallen from 1,892,000 to 862,000. In occupied territory the last figures show about 1,500,000 fully unemployed and 850,000 short-timers. In the iron and steel branches at the end of December 25.9 per cent were fully unemployed and 43.8 per cent were short-timers. The figures for the end of January will show a marked improvement.

Pig Iron.—The Pig Iron Syndicate has refused to cut prices. Consuming manufacturers therefore peti-

---

British and Continental prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.30 per £1, as follows:

Durham coke, delivered	£1 16s.			$7.74
Bilbao Rubio ore†	1 4			5.16
Cleveland No. 1 foundry	5 0			21.50
Cleveland No. 3 foundry	4 17			20.85
Cleveland No. 4 foundry	4 15			20.42
Cleveland No. 4 forge	4 14			20.21
Cleveland basic	4 17½			20.96
East Coast mixed	5 1			21.71
East Coast hematite	4 19	to £5 0s.		21.28 to $21.50
Ferromanganese	17 0			73.10
Rails, 60 lb and up	9 0	to 10 0		38.70 to 43.00
Billets	8 0	to 8 5		34.40 to 35.47
Sheet and tin plate bars, Welsh	8 18¾			38.43
Tin plates, base box	1 4	to 1 4½		5.16 to 5.27
				C. per Lb.
Ship plates	9 15	to 10 5		1.87 to 1.97
Boiler plates	13 0	to 13 10		2.50 to 2.59
Tees	9 15	to 10 5		1.87 to 1.97
Channels	9 0	to 9 10		1.73 to 1.82
Beams	8 15	to 9 5		1.68 to 1.77
Round bars, ¾ to 3 in.	10 10	to 11 0		2.01 to 2.11
Galvanized sheets, 24 g.	18 5	to 18 10		3.50 to 3.55
Black sheets, 24 gage	13 10	to 13 15		2.59 to 2.64
Black sheets, Japanese specifications	15 5			2.93
Steel hoops	12 10	& 12 15*		2.40 & 2.45*
Cold rolled steel strip, 20 gage	17 10			3.36

*Export price. †Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

(*Nominal*)

Foundry pig iron:			
Belgium	£4 2½s.		$17.74
France	4 2½		17.74
Luxemburg	4 2½		17.74
Billets (nominal):			
Belgium	6 0		25.80
France	6 0		25.80
Merchant bars:			C. per Lb.
Belgium	6 15		1.29
Luxemburg	6 15		1.29
France	6 15		1.29
Joists (beams):			
Belgium	6 5		1.20
Luxemburg	6 5		1.20
France	6 5		1.20
Angles:			
Belgium	8 0	to £8 5s.	1.53 to 1.58
¼-in. plates:			
Belgium	7 15		1.49
Germany	7 15		1.49
⅜-in. plates:			
Luxemburg	7 15		1.49
Belgium	7 15		1.49

tioned the Government to reduce import duties; but this so far has not been done. As justification of its price policy the syndicate has issued a statement that, whereas present pig prices are, according to quality and selling district, between 17 and 32 per cent above those of 1913, domestic and foreign ores are 50 to 75 per cent higher, coke 110 per cent higher and railroad rates 100 to 150 per cent higher. This is in gold marks. Latest prices for hematite are 105 gold marks per metric ton; foundry iron No. 1, 92 m.; No. 3, 90 m.

The syndicate does not mention that the smelting corporations have paid off their gold mark bonded debts with paper marks, and that the 10-hr. day has been re-established practically everywhere. In unoccupied territory all smelters nevertheless affirm that they are selling below production cost. In occupied territory, where the big corporations largely consume their own pig iron, things are better. The agitation for cheaper pig iron is strong, and, as the general price level continues to fall, a moderate pig price reduction is likely at the beginning of February. The home scrap market is dead. On the Ruhr, scrap (Kernschrott) fetches 34 to 35 Dutch gulden a ton. Export of scrap is still forbidden.

Rolled Steel.—Since the dissolution of the Price-Fixing Commission of the Steel Syndicate, confusion has prevailed concerning prices of semi-finished and rolling mill materials. The producers quote prices which they declare to be below production cost, but the dealers, in whose hands are large stocks and who are obliged to realize, quote still lower prices, bars selling down to 120 gold marks a ton. To remedy these conditions, the producers' representatives last week met at Hagen, and "recommended" the following as minimum prices:

	Gold Marks per Metric Ton	Equivalent, Cents per Lb.
Bars	130	1.40
Construction forms (beams)	127	1.37
Universal iron (plates)	140	1.51
Bands	165	1.78
Thick sheets (over 5 mm.)	150	1.62
Medium sheets (3 to 5 mm.)	165	1.78
Thin sheets (1 to 3 mm.)	175	1.89
Thin sheets (under 1 mm.)	185	2.00
		Per Gross Ton
Wire rods	160	$38.72

No prices were suggested for semi-finished material; for ingots, blooms, billets and slabs producers charge what they like. It is also doubtful whether the above "recommended" minimum prices will be observed, because the producers are no longer bound by conventional fines to follow the Steel Syndicate's instructions. The price drop is very heavy; bars late last year sold at 195 g. m. (2.11c. per lb.). As coal has fallen from a maximum last year of 38.46 g. m. to 18.40 g. m a ton, and as railroad rates were cut 8 per cent early this month, and will probably be again cut, the big price fall for Steel Syndicate products is easily explained.

Foreign Commerce.—The foreign trade balance in 1923 will prove to have been much more favorable than was believed. This has transpired through publication of gold mark value figures. During 1923 only weight figures were published. These indicated deterioration. In January to November, 1923, exports were only 11,600,000 metric tons against 22,400,000 tons in all 1922; while imports were 43,700,000 tons against 47,700,000 tons. The newly published value figures, however, show that, while imports shrank from 6,200,400,000 g. m. to 5,589,000,000 g. m., exports rose from 3,970,000,000 g. m. to 5,516,000,000 g. m. In the whole year 1923, the passive surplus, according to the Ministry of Industry, will not exceed 100,000,000 g. m., or about $24,000,000.

The Foreign Trade Board (Aussenhandelsstelle) for machinery has been dissolved. Of all these foreign trade boards, whose function was to license imports and exports and to fix minimum export prices, only eleven remain and these soon will be wound up. The great price difference between German and foreign goods has disappeared, and with that the board's functions have been made unnecessary.

Wolff and Russia.—The Otto Wolff Syndicate has given notice to terminate its agreement of October, 1922, with Soviet Russia. The reason stated is a difference of opinion concerning the renewal of Wolff's credit to the Soviet Government.

The law transforming Prussia's state coal mines, smelting works, and saline establishments into a public corporation has been sanctioned by the Diet. The state owns all the stock. The motive for the change is the need of replacing bureaucratic management by business methods. Financially, the new company will have to shift for itself.

CHEAPER IRON AND STEEL

German Industry Affected by Decline of Franc—Cooperation in Financing Sales—Labor Troubles Lessening

BERLIN, GERMANY, Jan. 24.—Iron and steel works, especially in the occupied area, are struggling hard against foreign competition. They are greatly in want of orders and have to make heavy price concessions. There is great confusion in regard to prices. Supplies are plentiful, but the trade and consumers show little inclination to buy, owing to the uncertainty of market developments in the near future. Some tenders are so low that they can hardly cover costs. Iron from the Saar district has been quoted in the Dortmund district as low as 110 g. m. ($26.60); a price at which Rheinisch-Westfalian works cannot compete. Deliveries to the unoccupied area are still hampered by the duty and the troubles in railroad transport.

Aided by the drop in the franc the French and the Saar iron industries are making great exertions to predominate the world's markets and to oust German competition, at least for some time. The Iron Traders' Association is allowing its members in the Hagen and Aachen districts to fix their prices independently of the quotations of the association, to enable them to meet the French, Luxemburg and Belgian competition. This has become very strong there, owing to the depreciation of the French currency, which has enabled the dumping of material in the German market, with the effect that German home prices are only 25 to 30 per cent above pre-war level, though raw materials, coal, scrap, limestone, etc., are still more than 50 per cent dearer than pre-war. The price of blast furnace coke has been reduced from 36.40 to 31.40 m. per ton, but even this is still 75 per cent higher than pre-war quotations.

French bids have been as low as 600 fr. per ton for bar iron, which at the present rate is about 115 g. m., a quotation considerably below average German works prices. The association has generally increased the fine for price cutting from 10 to 10,000 g. m., but it is improbable that it will be able to maintain its prices, which for bar iron, for instance, are 180 m., and for structural shapes, 170 m., per ton. The high freight rates also restrict German competition and the scarcity of rolling stock in the Ruhr district is hampering transport, so that several mines already have been forced to work fewer shifts.

Prices for rolled material are still declining and bar iron has been offered by the works as low as 118 m. per ton (1.28c. per lb.). Works manufacturing rails as a specialty are in the market with greatly reduced prices, which are about equal to the lowest bar iron quotation.

Wire.—In rolled wire the works are fully booked and some are even declining orders for the usual sizes for short delivery. At a few of the iron works employment is improving. Average works prices in gold marks per metric ton are at present about:

Wire, rolled	160	(1.73c. per lb.)
Wire, drawn bright	190	(2.05c. per lb.)
Wire, galvanized	230	(2.48c. per lb.)

Orders on hand enable the plants to keep their men employed for a time yet, especially as the works have mostly succeeded in coming to terms with their customers in regard to prices on old contracts. Sales from the confiscated stocks are also depressing prices. Billets said to be from these stocks have lately been offered at 490 fr., which is less than 100 g. m., while the German quotations are about 115 g. m. per ton.

Luxemburg Iron.—Owing to the depreciation of the franc the Luxemburg pig iron prices are mostly fixed

now in other and higher currencies. Hematite is quoted at 100s., foundry iron No. 1 at 95s. and No. 3 at 94s. per ton. The German Pig Iron Association has reduced the price for Luxemburg foundry iron No. 3 to 340 fr. per ton. As the Luxemburg works are quoting 400 fr. per ton for original Luxemburg foundry iron No. 3, with 1.8 to 2.5 per cent silicon, the new German prices will be a strong bar to imports. Lorraine works are also giving their prices in dollars or pounds now, and it is expected that this measure will help to restore greater stability to the German market. The German domestic market in scrap continues quiet. Demand is slack at present and, export being prohibited, little business is done. Quotations are 38 to 40 Dutch florins per ton for steel scrap and 48 to 50 for cast iron scrap.

Manufacturing.—Most German foundries and engineering works also are poorly booked. They find that they are unable to compete at home as well as abroad, owing to the high prices of raw material, and they have petitioned the Government to abolish import restrictions for British pig iron and to reduce the import duty from 10 to 6 g. m. per ton. It is doubted that the Government will give its sanction. Engineering firms have strongly criticised the existing German pig iron prices and threatened to import their requirements from abroad.

The Iron Founders' Association (Giessereiverband) has announced a reduction in prices for all castings, except specialties, of 10 per cent, and allows a fortnight for payment. The Remscheid, Velbert and Schmalkalden tool and hardware industry is poorly employed. Though a few firms have a slight increase in orders, a large number of works are still idle. Few orders are being booked and many firms are not in position to restart production, for want of working capital. Even the reduction of wages by about 20 per cent and the lower prices of raw material have not been able to enliven business. The Remscheid tool works producing specialties are unable to meet Austrian, Czechoslovakian and Swedish competition.

Cost of Living.—The latest German wholesale price index shows the effects of the gradual decrease in prices generally. During the week prior to Jan. 22 the wholesale index number decreased by 3.4 per cent to 115.7 (1913 = 100), foodstuffs by 5.9 to 100.6. The number for industrial products and coal and iron remained about the same. Home products went down to 106.5, while imported goods increased by 0.2 per cent to 162.

Strikes.—The strike movement in the iron and engineering industry is generally falling off, but some of the large works, the Becker steel works at Willich and the Hagen works of the Gelsenkirchener Gussstahl and Eisenwerke, for instance, are still closed on account of the strike. A great number of works are restarting production, though mostly on a small scale. In the Magdeburg and Halle districts the metal workers have rejected the terms of the employers' proposals on working hours and wages.

Agreements for an increase in hours have been concluded in many districts but there is still opposition in places where the more radical sections of the workers predominate. In Düsseldorf, for instance, there is still a strong struggle against extended hours and the Mannesmann tube works have not been able to restart production. In Upper Silesia the strike in the iron industry has come to a finish and, for the Central German districts, an award has been given by a court of arbitration which has been accepted by the representatives of both parties. It stipulates that, on principle, 48 hr. be the normal week; that, however, up to 56 hr. may be worked when there is need for it.

In the Ruhr districts an agreement has been arrived at in regard to wages. An unskilled worker above 21 years is to receive 0.40 m. (10½c.) per hour. The pay of a skilled workman shall, as a rule, be 25 per cent higher, and men especially qualified are to receive more. A guaranty for a certain higher wage to be attained on piece work is, contrary to previous practice, not given, but rates are to be fixed in such a way that the earnings are higher than the ordinary rate per hour.

In the Berlin district the rate for skilled workmen is 0.48m. per hour. Reductions in wages and salaries are taking place all around, which the trade unions cannot avert, as they are unable to call their members out, owing to lack of funds.

Cooperation and Financing.—Owing to the stagnation in business several plans have been brought out to alleviate the situation. Negotiations are pending for a working agreement between foundries and engineering works such that the founders supply the works with castings which are not immediately paid for, but for which an equivalent value in machinery is to be handed over to a trading concern, which is to distribute the results of the sales correspondingly. It is expected that the arrangement will help the engineering works to overcome the present difficulties in regard to payment for castings and give employment to the foundries.

BELGIAN MARKET MOVING UPWARD

Foreign Competition Slackening—Local Prices Strong and Advancing with Demand

BRUSSELS, BELGIUM, Feb. 1.—An improving tendency was in evidence in the Brussels market on Wednesday last. The extreme limit of the decline seemed to have been attained and prices are beginning to show a characteristic movement upward. Export activity is much greater and a fair amount of orders have been booked at home. Producers are consequently in a more favorable situation. Foreign competition with the French and Luxemburg plants has been less acute of late and the activity of the Germans has slackened.

There are rumors that the labor syndicates would try to get a new wage increase that employers would refuse, although the latter are quite willing to grant further indemnities for the cost of living.

Coke.—Inquiry is quite strong and the supply in coking smalls seems to be assured so far. The negotiations started in view of reestablishing the Syndicate des Cokes may last some time, as new difficulties are being encountered.

Pig Iron.—The market is stationary. In spite of the large stocks on hand, producers refuse to sell below the official tariff. Basic is in good demand, from Great Britain particularly. The Lorraine and Luxemburg plants are doing very little business here for the moment, as they have secured a large amount of orders, and the ruling quotations are maintained at 415 to 420 fr. ($16.98 to $17.18) for chill-cast pig iron No. 3 and 400 to 405 fr. ($16.37 to $16.57) for basic.

Semi-Finished Steels.—This market is reduced to very small dimensions and, owing to this fact, shows a marked tendency upward. Demand is excellent both for inland and export, but with very few disposals on hand as a good many forward contracts have been concluded. Purchases from Germany are also important. In basic steel, ingots are quoted 510 to 520 fr. ($20.87 to $21.28); blooms, 545 to 555 fr. ($22.30 to $22.71); billets, 575 to 590 fr. ($23.53 to $24.14).

Steel.—There is satisfactory activity at home and for export, with steady prices and a strong upward movement. The French have withdrawn from the market, thanks to the important orders they have taken of late. The Luxemburg and German plants are again in a position of expectancy while the home producers' situation has much improved within a fortnight.

Quotations f.o.b. Antwerp are on the average of 650 fr. (1.19c. per lb.) minima for Belgian bars and 580 fr. (French) (1.06c. per lb.) for French products. Beams are sold at 600 to 610 fr. per ton, (1.10 to 1.11c. per lb.), f.o.b. A few orders in U-shapes were sold at 645 fr. (1.18c. per lb.) on the inland market and 625 fr. (1.14c. per lb.) at export. Hoops are firm at 975 to 1000 fr. basis (1.78c. to 1.83c. per lb.), as well as rods at 825 fr. basis (1.51c. per lb.) and wire rods. The home quotations range 670 to 675 fr. (1.22c. to 1.23c. per lb.) for bars; 625 to 630 fr. (1.14c. to 1.15c. per lb.) for beams.

Sheets.—This market is busy and large transactions

are made in the heavy gage line, both at home and for export. Prices have been advanced 25 fr. per ton. The ruling quotation inland is about 750 fr. (1.37c. per lb.). In medium sheets a good many producers have withdrawn from the market, and prices have gone up. The light sheets are better sustained and the following prices are recorded for basic, per metric ton, at works or f.o.b. Antwerp:

	Fr.	
5 mm.....	725 to 735	(1.32c. to 1.34c. per lb.)
3 mm.....	800 to 825	(1.46c. to 1.51c. per lb.)
2 mm.....	875 to 900	(1.60c. to 1.64c. per lb.)
1.5 mm.....	950 to 975	(1.74c. to 1.78c. per lb.)
1.0 mm.....	1000 to 1050	(1.83c. to 1.92c. per lb.)
0.5 mm.....	1250 to 1300	(2.28c. to 2.37c. per lb.)

Scrap.—Very hesitating. Open-hearth scrap is sold at 355 to 365 fr. ($14.53 to $14.93); blast furnace, 340 to 350 fr. ($13.91 to $14.32), and high-grade machine shop, 390 to 410 fr. ($15.96 to $16.78).

JAPAN BUYS GAS PIPE

Tonnages for South Manchuria Railway and Government Railroads—Loan Expected to Stimulate Buying

NEW YORK, Feb. 19.—The announcement of the loan to the Japanese Government, allocated to the United States, Great Britain and Holland, has not as yet had any appreciable effect on export trade. The exchange value of the yen has not risen since the flotation of the loan of $150,000,000 in the United States, but the present quotation of 45.50c. on the yen is accounted for by the fact that the loan was discounted in exchange fluctuations two or three weeks ago, by an increase of several points in the value of the yen.

The loan, which totals $271,662,500, is divided, $150,000,000 being floated in the United States and Holland and £25,000,000 being floated in the United Kingdom. This total is being used to retire outstanding bonds on former loans of about $170,500,000, which would leave a total of $101,162,500 available for reconstruction and divided between British and American deposits.

The Government's reconstruction program, according to Kengo Mori, special finance delegate of the Imperial Government, calls for the expenditure of about $700,000,000, of which about $300,000,000 will be spent outside of Japan.

Lately there has been a fair demand from Japan for gas pipe and boiler tubes. Award has not yet been made on 170,000 ft. of gas pipe, 1½ to 4 in., asked for by the Imperial Government Railways. On a tender for 49,800 meters of ½, 1¼, 2 and 4-in. gas pipe from the South Manchuria Railway Co., about two-thirds is reported to have been placed with Mitsui & Co. and about one-third with the Mitsubishi Shoji Kaisha. An interesting sidelight on this purchase is provided through the award of an identical specification to a large export house dealing with China, of 49,800 meters of ½, 1¼, 2 and 4-in. gas pipe from its office in North China, destination of shipment unnamed. A recent inquiry of the South Manchuria Railway Co. for about 100 tons of boiler tubes was awarded to the Sumitomo works in Japan, maker of boiler tubes.

Shipments of portable steel buildings to Japan, which were fairly large prior to Jan. 1 of this year, are reported to have declined somewhat recently. This decline in purchases is attributed partly to a satisfactory supply and partly to the fact that a privately owned Japanese steel works has, since the earthquake, begun the manufacture of this type of housing. Although there is no official statement as to action on the present free list in the Japanese tariff law, which expires March 31, it is reliably reported that extension of the present exemption on certain articles is under consideration and announcement is expected by the government by the middle of March.

European Pig Iron

Although importers of pig iron continue to quote to American consumers, competition is only possible in certain districts. The higher phosphorus pig irons are more expensive than a few weeks ago, but low phosphorus foundry iron, equivalent to No. 2 plain, is sufficiently low to interest consumers, particularly in the New England district at points taking a low freight rate from Boston. One importer in New York is offering low phosphorus foundry iron, 2.25 to 2.75 per cent silicon, at $24.25 to $24.50 per ton, delivered Atlantic port, duty paid. Foundry iron of German origin is offered at $24.50 to $24.75 per ton, duty paid. A few sales of foreign iron in the New England district are noted. Tonnages are said to be largely confined to lots of 100 to 300 tons.

MINING ENGINEERS

Large Attendance at Steel Sessions of Annual February Convention in New York

NEW YORK, Feb. 19.—A large number of men, prominent in the metallurgical and operating departments of the steel industry, is in attendance at the sessions of the iron and steel division of the American Institute of Mining and Metallurgical Engineers, which is holding its 129th meeting at the Engineering Societies Building, in New York, Feb. 18 to 21. Two sessions devoted to iron and steel, one on Monday afternoon, Feb. 18, and the other on Tuesday afternoon, Feb. 19, presented programs of unusual interest and covering a wide variety of subjects.

The meeting Monday afternoon contained three papers on new developments in metallography, one paper on the use of zirconium in the production of high sulphur steels, and two papers on certain theoretical phases of the constitution of metals. The second section on Tuesday afternoon was devoted to papers involving problems in open-hearth practice, on ingot molds and a somewhat animated discussion of stainless steel and iron, brought up by a paper from a British source. It was necessary to postpone part of the program for this session to a special meeting Wednesday morning, Feb. 20. The report of the papers and discussions of these two sessions, together with other features of the convention as a whole, will appear in THE IRON AGE of Feb. 28.

Two annual lectures, which attracted wide attention by large audiences, were the annual Institute of Metals address by Dr. Zay Jeffries of Cleveland, on "The Trend in the Science of Metals," on Monday afternoon, following the steel session, and the first annual Dr. H. M. Howe Memorial Lecture by Dr. Albert Sauveur of Harvard University, Cambridge, Mass., also following the steel session on Tuesday afternoon. Abstracts of these addresses are found elsewhere in this issue, on pages 571 and 581 respectively.

An interesting symposium on "Oxygenated Air in Metallurgy" is scheduled for Wednesday afternoon, Feb. 20. The convention as a whole, covering sessions on petroleum, coal, metallurgy, industrial relations, nonferrous subjects and other topics, is to close with the annual banquet on Wednesday evening, Feb. 20, at the Waldorf-Astoria Hotel, followed by an excursion Thursday to the works of the Bethlehem Steel Corporation at Bethlehem, Pa.

British Steel Exports for January

WASHINGTON, Feb. 19.—Exports of iron and steel products from the United Kingdom during January, 1924, amounted to 337,724 gross tons and imports aggregated 141,590 tons, says a statement issued by the Department of Commerce. These figures compare with 353,389 and 128,855 respectively for January, 1923, and 360,000 and 110,230 for the monthly averages for that year.

Iron and Steel Markets

RAILROAD BUYING

Carriers Outstanding in Current Purchasing

Production Keeping Pace with Increasing Demand—Prices Well Maintained

Railroad car buying is the feature of the steel market. Close to 30 per cent of all the steel purchases so far this year are for the carriers, a rate which if kept up would be about 10 per cent more than the proportion last year. As to other channels of consumption, demand is well scattered and has encouraged further expansion of steel making activity.

Production appears close to a 45,000,000-ton annual rate, with the Steel Corporation operating at better than 94 per cent of capacity. The large volume has resulted without the stimulus of a threatened price advance and gives no sign of abatement because the coal strike threat has been removed. Bethlehem's Lackawanna plant has now seven blast furnaces active and indications are that the Steel Corporation's twelfth Gary furnace will be lighted within a week and that one more stack at both South Chicago and Joliet will go in before the end of the month.

Though jobbers' stocks are reported fully up to normal, there are cases of both jobbers and manufacturing consumers specifying for quantities in excess of their first quarter contracts. The indication of heavy consumption is accompanied by little extension of delivery dates, supply keeping close step with increasing demand. It is difficult to find a parallel for the situation of buyers' confining their takings to 30 and 60 days in the face of 85 per cent of capacity operations.

Belief that no higher prices are ahead accounts in part for the conservative buying attitude. It has been bolstered by the action of the American Sheet & Tin Plate Co. in opening its books on Feb. 18 on sheets and tin plate for second quarter delivery at today's prices.

Due in part to plate orders from car builders, but also to structural shape business from fabricators and more particularly to bar commitments from various sources, Chicago district mills, however, are booking considerably more than they are shipping. Generally, the price situation is firm on practically all products except plates, track supplies, light rails and hot-rolled strip. Sheets are notably firm in the light that March shipments may still be obtained.

The car buying in prospect seems large, though some of it still is indefinite. The Norfolk & Western increased its orders from 4000 to 6000 cars, and the past week's purchases in all were over 6200. The cars for the New York Central and Pennsylvania are expected to take 200,000 tons and more of steel. Locomotive orders of size also seem to be near settlement.

Railroad requirements account for more than 12,000 tons of the 34,000 tons of structural steel work awarded during the week. A bridge for the Louisville & Nashville will take 6500 tons and car shops of the Southern Railway 4100 tons. Some 12,600 tons will go into two office buildings in Philadelphia and Detroit. Fresh inquiries are light, totaling less than 9000 tons.

Fabricated steel bookings in January were 187,200 tons, 10 per cent off from December. They compare with 189,800 tons for January, 1923, and 166,800 tons, the monthly average of last year.

Automobile and automotive parts manufacturers, with probably not a month's stock of steel, expect further to expand operations. At Detroit the number employed is put at 363,000, the largest on record.

Aside from the purchase of about 25,000 tons by a radiator company, the pig iron market has been extremely quiet and prices in southern Ohio have receded 50c. Alabama iron is quoted not less than $23, Birmingham, but Tennessee iron can still be had on a basis of $22.50, Birmingham. A limited tonnage of Southern iron has been sold as far North as Chicago at $23, Birmingham.

The agreement of the operators and miners to extend the present wage scale three years, thus preventing a strike in the bituminous region, will tend to check the probably temporary advance of pig iron prices which undoubtedly would have resulted. It seems probable, however, that many union mines will be compelled to close on account of the high cost of operating.

Steel plates are not difficult to get in the East at 2.30c., Pittsburgh, and for cars 2.20c. has been done.

Congestion of scrap at Pittsburgh has resulted in embargoes at several mills, throwing scrap back upon Eastern mills and resulting in a break in prices of 50c. to $2 a ton on almost every grade.

Although foreign structural shapes can be sold at fully $13.50 per ton under best domestic delivered prices at Philadelphia, only a few thousand tons have been sold, uncertainty of deliveries holding prospective buyers back.

Despite a slight drop, from 2.789c. to 2.775c. per lb., THE IRON AGE finished steel composite price remains at a level which has been maintained, with practically no change, since early in May.

Pittsburgh

Buyers of Steel Extremely Conservative—Higher Prices Not Expected

PITTSBURGH, Feb. 19.—The steel industry is passing through an experience with regard to purchases that finds no parallel in recent years. Buyers are confining their takings to 30 and 60 days' requirements and with the first quarter of the year more than half gone, there is as yet little, if any, second quarter business on the books of the steel makers. The mills are having practically no difficulty in meeting all of the demands that are being made upon them, and while here and there delivery promises have been extended to four and five weeks from the time of placing of the order, the more common condition is that more prompt deliveries still are being made.

Since the mills are not booked very far ahead and

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Feb. 19, 1924	Feb. 12, 1924	Jan. 15, 1924	Feb. 20, 1923
No. 2X, Philadelphia‡	$24.13	$24.13	$24.26	$29.76
No. 2, Valley furnace†	23.00	23.00	22.50	28.00
No. 2, Southern, Cin'ti†	26.55	26.55	25.05	29.05
No. 2, Birmingham, Ala†	22.50	22.50	21.00	25.00
No. 2 foundry, Chicago*	24.50	24.50	24.00	30.00
Basic, del'd, eastern Pa.	22.75	22.75	23.25	28.25
Basic, Valley furnace	22.00	22.00	21.00	26.50
Valley Bessemer, del. P'gh.	25.26	25.26	24.76	29.77
Malleable, Chicago*	24.50	24.50	24.00	30.00
Malleable, Valley	23.00	23.00	22.50	28.00
Gray forge, Pittsburgh	23.76	23.76	23.76	29.27
L. S. charcoal, Chicago	29.15	29.15	29.15	33.15
Ferromanganese, furnace	107.50	107.50	109.00	107.50
Rails, Billets, Etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Bess. billets, Pittsburgh	40.00	40.00	40.00	40.00
O.-h. billets, Pittsburgh	40.00	40.00	40.00	40.00
O.-h. sheet bars, P'gh.	42.50	42.50	42.50	40.00
Forging billets, base, P'gh.	45.00	45.00	45.00	47.50
O.-h. billets, Phila.	45.17	45.17	45.17	45.17
Wire rods, Pittsburgh	51.00	51.00	51.00	50.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.30	2.30	2.35	2.25
Light rails at mill	2.00	2.00	2.25	2.15
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.57	2.57	2.62	2.475
Iron bars, Chicago	2.40	2.40	2.40	2.50
Steel bars, Pittsburgh	2.40	2.40	2.40	2.25
Steel bars, Chicago	2.50	2.50	2.50	2.25
Steel bars, New York	2.74	2.74	2.74	2.59
Tank plates, Pittsburgh	2.40	2.50	2.50	2.25
Tank plates, Chicago	2.60	2.60	2.60	2.35
Tank plates, New York	2.64	2.69	2.74	2.59
Beams, Pittsburgh	2.50	2.50	2.50	2.25
Beams, Chicago	2.60	2.60	2.60	2.35
Beams, New York	2.74	2.74	2.74	2.59
Steel hoops, Pittsburgh	3.00	3.00	3.00	2.90

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	Feb. 19, 1924	Feb. 12, 1924	Jan. 15, 1924	Feb. 20, 1923
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	3.85	3.85	3.85	3.50
Sheets, galv., No. 28, P'gh.	5.00	5.00	5.00	4.60
Sheets, blue an'l'd, 9 & 10	3.00	3.00	3.00	2.65
Wire nails, Pittsburgh	3.00	3.00	3.00	2.80
Plain wire, Pittsburgh	2.75	2.75	2.75	2.65
Barbed wire, galv., P'gh.	3.80	3.80	3.80	3.45
Tin plate, 100-lb. box, P'gh.	$5.50	$5.50	$5.50	$4.75
Old Material, Per Gross Ton:				
Carwheels, Chicago	$21.50	$21.00	$20.50	$27.50
Carwheels, Philadelphia	20.00	21.00	20.00	25.00
Heavy steel scrap, P'gh.	21.00	22.00	21.50	23.50
Heavy steel scrap, Phila.	18.00	19.00	18.00	21.00
Heavy steel scrap, Ch'go.	18.00	18.00	17.00	20.00
No. 1 cast, Pittsburgh	21.50	21.50	21.00	25.00
No. 1 cast, Philadelphia	19.50	21.00	20.50	24.00
No. 1 cast, Ch'go (net ton)	21.00	21.00	20.50	24.00
No. 1 RR. wrot. Phila.	21.00	22.00	21.50	25.00
No. 1 RR. wrot. Ch'go (net)	15.50	15.50	15.00	18.00
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	$4.15	$4.00	$4.00	$7.00
Foundry coke, prompt	5.00	4.75	4.75	8.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	13.62½	12.75	12.75	16.00
Electrolytic copper, refinery	13.25	12.50	12.25	15.75
Zinc, St. Louis	6.92½	6.72½	6.35	7.30
Zinc, New York	7.27½	7.07½	6.70	7.65
Lead, St. Louis	8.90	8.85	8.00	8.10
Lead, New York	9.00	8.90	8.25	8.15
Tin (Straits), New York	53.50	52.00	49.50	42.62½
Antimony (Asiatic), N. Y.	11.00	10.50	10.00	7.12½

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, Feb. 19, 1924, Finished Steel, 2.775c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

Feb. 11, 1924,	2.789c.
Jan. 22, 1924,	2.789c.
Feb. 20, 1923,	2.631c.
10-year pre-war average,	1.689c.

Composite Price, Feb. 19, 1924, Pig Iron, $22.86 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

Feb. 11, 1924,	$22.86
Jan. 22, 1924,	22.19
Feb. 20, 1923,	27.38
10-year pre-war average,	15.72

deliveries in four weeks are practically a normal condition, there is a complete absence of the scramble for tonnage which featured the market at this time last year. By the same token, premium prices are absent, and the belief that no higher prices are immediately ahead is strengthened by the action of the American Sheet & Tinplate Co. in opening its books yesterday on sheets and tin plate for second quarter delivery at today's prices. The fact that the great bulk of the orders now in the mills represents legitimate requirements as distinct from orders placed as a safeguard against future exigencies is adduced as evidence of the sound, healthy character of the demand. Without the assistance of a possible advance in prices there has been sufficient business to give the Steel Corporation an operation of 90 per cent of capacity on an average. It is believed that, as new orders have been at least as large as shipments against old ones, this month, this rate will be maintained for some time, since next month is expected to bring a good deal of second quarter business.

Weakness in the stock market resulting from the Naval oil land lease investigation in Washington has created some uncertainty in the trade, but as a general rule the inquiry is regarded as a political matter and as yet does not outweigh the fact that the steel business is not only good but is sound and healthy. It would be some exaggeration to describe the market as strong, because it contains a number of weak spots, due to the fact that with buyers keeping their purchases down to nearby requirements, there are some producers who cannot round out an economical producing schedule and

this usually leads to price concessions. It is doubtful whether the automotive industry as a whole is carrying stocks of steel sufficient for more than three weeks' requirements. This is rather significant in view of the fact that this industry had the smallest inventories at the end of last year in its history and last month was the biggest January in point of production that it ever had. Evidence that the railroads will buy more steel for other than equipment purposes this year is found in the placing of a 6500-ton bridge by the Louisville & Nashville Railway.

The idea that the agricultural implement industry will be a liberal buyer of steel finds little support in the experiences of local producers. There is more talk of the shelving of structural projects on account of cost than was the case recently, this despite the fact that bids generally are based upon structural steel at nearer 2c. than the current quotation of 2.50c.

The pig iron market gives plain evidence that producers' price ideas have gone up faster than those of consumers. Such tests as have been made have demonstrated that iron is available well below the prices that are asked. The inability of the pig iron market to gather strength seems to hold the coke market in check and effort on the part of coke producers to obtain $4.50 per net ton at ovens for furnace grade for second quarter shipment so far has been unavailing. Lack of outlet for current offerings of scrap has resulted in a materially weaker market, notably in heavy melting steel and turnings and borings.

Blast furnace activities in this and nearby districts show no change in the number of furnaces active. The Jones & Laughlin Steel Corporation has put out for relining one of its Aliquippa stacks, but this loss is offset by the adding of one furnace at the Cambria works, Bethlehem Steel Co., Johnstown, Pa. Of the 140 furnaces in this and nearby districts, 107 are now in production.

Pig Iron.—The old statement that the House of Representatives proposes and the Senate disposes finds application in the present pig iron situation, in that buyers seem to be disposing of the prices proposed by producers. In the face of the fact that Valley furnaces are generally quoting basic iron at $23, a nearby sheet maker recently was able to secure 300 tons of that grade at a delivered price equivalent to $21.75 at Valley furnace. A large electrical manufacturing company which recently inquired for about 4000 tons of foundry iron was able to do very much better than $24 for No. 2 grade at Valley furnace. Actually it secured its tonnage at the equivalent of $23, Valley furnace. Practically all users of Bessemer iron covered their immediate requirements late last month at $23 and now are not interested in additional supplies at prices 50c. to $1 higher. We make no change in our quotations, but the market is dull and, if anything, weak.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$22.00 to $23.00
Bessemer	23.00 to 24.00
Gray forge	22.50 to 23.00
No. 2 foundry	23.00 to 24.00
No. 3 foundry	22.50 to 23.00
Malleable	23.00
Low phosphorus, copper free	29.00 to 30.00

Ferroalloys.—Hardly enough business is being done here to establish any change in prices. There are intimations that domestic producers of ferromanganese still are taking business at $106.50, furnace, with freight equalized from seaboard points, but this is vigorously denied. The report probably grew out of the fact that most consumers, who had placed orders for domestic material at $109, were allowed to enter additional business at that price in order to bring down their average prices to about the current quotation of both domestic and British producers, or $107.50. New business in 50 per cent ferrosilicon is very limited and only small tonnages of spiegeleisen are sought. Prices are given on page 615.

Semi-Finished Steel.—Current demands are few and small, but not much tonnage is being pressed for sale, so many producers being well sold up on billets, slabs and sheet bars for the present quarter, and prices are fairly firm at recent levels. Nonintegrated mills are buying closer to real needs than usual, because of good deliveries and the fact that there is nothing in sight to indicate higher finished steel prices in the near future, which naturally discourages thought of higher raw material prices. The American Sheet & Tin Plate Co. yesterday opened its books for second quarter business and reaffirmed present prices for that period on both sheets and tin plate. Similar action is probable by independent makers, and it is generally conceded that sheet bars at $42.50 are high enough on the present and second quarter prices of sheets. Real activity still is lacking in forging billets, skelp and rods, although some makers of the latter are managing to round out schedules from their day to day orders. Products of rods are not moving with sufficient freedom to encourage much forward buying of the raw product. Prices are given on page 615.

Wire Products.—While experiences of different producers as to business vary, the more common report still is that demand is expanding. It is evident, however, that buyers are keeping their purchases well within the bounds of actual requirements, for all mills are making prompt deliveries on new business. It is difficult to convince buyers of possible shortages later in the year or that prices will be any higher and the buying reflects in no small degree that attitude. Plants in and near Pittsburgh are operating anywhere from 60 to 85 per cent, with the leading interest running about 80 per cent. Prices show no special change. Weakness still is noted in coated nails, with Middle Western mills reported to be going as low as $2.50 base, per count keg, Pittsburgh, although it is doubtful whether this price would be made for shipments toward Pittsburgh. Prices are given on page 614.

Plates.—Engagement of plate mill capacity in this and nearby districts finds its chief explanation in the demand for pipe and the incident need of skelp rather than in the demand for plates as such. In this district there is no shading of the regular price, but mills here are not ignoring the lower prices of Eastern and Western mills and in many cases are meeting them in competitive territory. Prices are given on page 614.

Steel Rails.—At 2c. base, there seems to be a somewhat better business in light rails than there was at the former price. We still quote the market at 2c. to 2.15c. base, but only retail lots are bringing more than the lower figure.

We quote soft steel bars, rolled from billets, at 2.40c. base; bars for cold finishing of screw stock analysis, $3 per ton over base; reinforcing bars, rolled from billets, 2.40c. base; refined iron bars, 3.25c. base, in carload lots or more, f.o.b. Pittsburgh.

Hot-Rolled Flats.—There is reasonably good observance of the 3c. base on the products under the heading, but some makers of hoops and bands who are not very well provided with orders find it necessary to go to 2.90c. for tonnages to round out their schedules, and on wide strips there is the usual recognition of blue annealed sheet and plate competition, which means an arbitrary base on this material of about 2.75c. Prices are given on page 614.

Iron and Steel Bars.—Some mills here have succeeded in getting buyers to cover their requirements a little further ahead, and this has caused some extending of delivery promises, but not to an extent sufficient to stiffen prices. There is considerable 2.40c. business on mill books, but much more at lower figures, embracing extended old contracts and the backlog tonnages taken in December, when most mills were hungry for business. There is no change in iron bars, demand for which is steady but hardly active.

We quote light rails rolled from billets at 2c. to 2.15c. base (25-lb. to 45-lb.); rerolled rails, 1.85c. to 2c. base (12-lb. to 45-lb.), f.o.b. mill; standard rails, $43 per gross ton mill, for Bessemer and open-hearth sections.

Structural Material.—It is apparent from testimony of local fabricating companies that the recent volume of inquiries was somewhat misleading as to actual business. Cases where projects have been deferred on account of costs are rather more numerous than they were recently, and the complaint is common that price competition still is sharp. Mills in this district are

holding pretty firm to quoted prices, but the existence of so much lower priced steel in the hands of fabricators, either actually or in the form of protections, is something of a hindrance to sales. Prices are given on page 614.

Tubular Goods.—Mill capacity in this and nearby districts is filling up steadily under the wave of buying incident to the building up of stocks by jobbers against the spring demands. In the South particularly, but to some extent throughout the country at large, the open winter has permitted the prosecution of building activities, and this means that standard pipe is going into consumption rather freely for the time of year. Actual consumption of oil country pipe is not as heavy now as it will be later and purchases of this class of pipe are more for stock than for immediate use. Deliveries still are reasonably prompt, though having accumulated a fair-sized backlog, mills are not shipping as quickly as they could a month or so back. Hope Natural Gas Co. is in the market for 60,000 ft. of 12-in. pipe and 75,000 ft. of 20-in. pipe at a total of about 4000 tons. A. M. Byers Co. has announced an increase in the plugging and reaming extras of the sizes smaller than ¾ in. in all weights of from $4 a ton to $8, but has made no change in the extra on sizes 1 in. and larger. The former extra of two points, or $4 per ton, continues for plugging and reaming all sizes of steel pipe. Boiler tubes still are very dull in keeping with the fact that neither boiler nor locomotive builders are very well supplied with business; prices are easy and the possibility of an actual reduction in prices also tends to make buyers cautious. Discounts are given on page 614.

Sheets.—American Sheet & Tin Plate Co. yesterday announced the opening of its books for second quarter business at the same prices it has quoted for the present and the two preceding quarters, or 3.85c. base, for black, 5c. base for galvanized, 3c. base for blue annealed, and 5.35c. for automobile body stock. It is probable that independent mills will open their books for the second quarter at the same levels, since most of them now are quoting those prices. It is known that the automobile manufacturers lately have shown considerable interest in prices of second quarter tonnages and they now are expected to place orders rather freely, although it has been the tendency of these interests generally to buy sparingly and let the mills carry the stock. Automobile sheet units of the American Sheet & Tin Plate Co. are well sold up for the remainder of this quarter, but not so solidly that deliveries are becoming much deferred. It is too soon to establish the reaction to the reaffirmed prices, but in the absence of an advance or difficulties about deliveries, it is probable that buyers will continue to refrain from purchasing much in excess of known requirements. Prices below ruling quotations have not disappeared entirely, but it is said that there is less shading this month than there was in January. Industry as a whole is operating at slightly above 81 per cent. Prices are given on page 614.

Tin Plate.—Reaffirmation of the present prices of $5.50 per base box Pittsburgh for standard coke tin plate for the second quarter by the American Sheet & Tin Plate Co. was merely formal, since that interest late last year booked itself solidly for the first half of this year at that figure. Most of the independents followed suit. Current demand for tin plate is light because all of the important consuming interests are covered by contract. Specifications, however, are good, and there is practically full operation of both Steel Corporation and independent capacity.

Cold-Finished Steel Bars and Shafting.—Business is good with all producers in this district, although an absence of large forward buying still is commented upon. Deliveries are being made so promptly that buyers generally feel safe in buying close to their known requirements. This policy tends to keep mill obligations down and to prevent deferred deliveries. The common quotation still is 3c. base Pittsburgh, but in Detroit and Toledo there have been sales lately at 2.90c. base, and this cannot be very well charged to equalization of freight with Chicago, since Chicago has only a slight freight advantage to Detroit and none to Toledo over Pittsburgh. Ground shafting is unchanged at 3.40c. base, f.o.b. mill, for lots of a carload or more.

Bolts, Nuts and Rivets.—Bolt and nut makers generally report an improved business, but none makes the claim that much of it is at the published discounts. So large a percentage of the consuming trade was allowed to contract for the present quarter at well below today's prices that it is improbable that present quotations will find basis in sales until the next quarter.

Cold-Rolled Strips.—This product still is quotable on 4.75c. to 5c., base Pittsburgh, although only a small part of current shipments carry the higher figure. Makers expect to open their books for second quarter in a week or ten days and it is believed will name 5c. base. Most of the contracts for this quarter were taken at 4.75c. base and some difficulty lately has attended efforts to maintain the 5c. base, established after the mills had accumulated a fair sized back log at the lower figure.

Coke and Coal.—Spot furnace coke has become rather scarce lately, due to the fact that contracts have been absorbing practically all of the production. This has resulted in a firmer market with ordinary brands, which could be had at $4 per net ton at ovens recently, now commanding $4.15 and choice brands $4.25. Prices on second quarter coke are no higher because pig iron producers are disposed to move slowly because of the failure of the pig iron market to move to a profitable level. We regard the contract market as $4.25, although producers with idle capacity declare that they will not start it up at less than $4.50. Spot foundry coke also is firmer, as production is lighter. The market now is quotable from $5 to $5.50. Contract foundry coke ranges from $5.50 to $6.50. The coal market still is very dull and weak. Mine run steam coal still ranges from $1.60 to $2 per net ton at mine; gas coal from $2.25 to $2.50 and coking grade from $1.75 to $2.15.

Old Material.—This market has grown decidedly weaker since last accounts, the continued absence of consumers from the market having told on the price ideas of the dealers, who also have been rather anxious to find an outlet for material which cannot be delivered on account of embargoes at the plants of several recent buyers. Open weather has prevented any piling up of scrap at originating points this winter and with the mills getting free deliveries against their contracts there is no disposition to seek additional supplies. Failure of the pig iron market to advance also has been an obstacle in the path of higher scrap prices. There was a small sale of heavy melting steel about the middle of last week at $21.75, but since then this grade has been offered at $21.50 without takers, and it is good opinion that it could be bought at $21. Certainly no dealer would pay more, and it is doubtful whether a consumer could be induced to buy at that price, especially in view of weaker advices from other consuming centers. Compressed sheets have sold at higher prices and now are quotable at the usual differential of $1 a ton below heavy steel scrap. Machine shop turnings cannot be sold today above $16 and $16.50 is the top bid on shoveling turnings and cast iron borings. The list averages fully 50c. a ton below last week's levels.

We quote for delivery to consumers' mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel	$21.00 to $21.50
No. 1 cast, cupola size	21.50 to 22.00
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	23.00 to 23.50
Compressed sheet steel	20.00 to 20.50
Bundled sheets, sides and ends	18.50 to 19.00
Railroad knuckles and couplers	23.00 to 23.50
Railroad coil and leaf springs	23.00 to 23.50
Low phosphorus blooms and billet ends	25.00 to 25.50
Low phosphorus plate and other material	24.00 to 24.50
Railroad malleable	19.50 to 20.00
Steel car axles	23.00 to 23.50
Cast iron wheels	20.00 to 20.50
Rolled steel wheels	23.00 to 23.50
Machine shop turnings	16.00
Sheet bar crops	23.00 to 23.50
Heavy steel axle turnings	19.00 to 19.50
Short shoveling turnings	16.50 to 17.00
Heavy breakable cast	20.00 to 21.00
Stove plate	16.00 to 17.00
Cast iron borings	16.50 to 17.00
No. 1 railroad wrought	16.50 to 17.00
No. 2 railroad wrought	21.00 to 21.50

Chicago

Car Buying Active—Great Activity of Automobile Companies

CHICAGO, Feb. 19.—Railroad car buying is the feature of the market. The Santa Fe has closed for 2000 additional cars, bringing its total purchases up to 4000 cars, while the New York Central is placing orders today and tomorrow for 17,000 cars. The Pennsylvania has put out inquiries for 8000 box and 1000 stock cars, and the Missouri Pacific has entered the market for 1000 automobile cars.

Due in part to plate orders from car builders, but also to structural shape business from fabricators and more particularly to bar commitments from varied sources, local mills rolling the heavier forms of steel are booking considerably more tonnage than they are shipping. In some instances, both jobbers and manufacturing consumers have over-specified their first quarter contracts. Billet and sheet bar users are also specifying very fully, and at the same time new business in all of the products mentioned is in large volumes. The price situation is firm on practically all products with the exception of track supplies, light rails and hot-rolled strips.

Industrial activity in this district is not at a record-breaking rate, when one considers the situation as a whole. Automobile and automotive parts manufacturers, however, are running full and expect further to expand their operations. At Detroit the number of employed, at 363,000, is the largest on record. Farm implement makers continue to show gradual improvement in their production and find the outlook in their field more favorable, even in the Northwest.

The increased obligations of local mills are reflected in expanded operations. The Illinois Steel Co. has put in an additional furnace at Gary, giving it 11 active stacks at that plant, nine at South Works and three at Joliet out of a total of 27. The twelfth Gary furnace is expected to be lighted within a week and one more stack each at South Chicago and Joliet will probably go in before the close of the month. The company's steel output ranges from 93 to 95 per cent of ingot capacity. The Inland Steel Co. remains on a 75 per cent basis.

Pig Iron.—The market shows little life, although the price situation is unchanged. At the moment, spot buying is the principal source of new tonnage. While second quarter orders are few, a considerable volume of business has been booked for that delivery since the first of the year, variously estimated at from 50 to 60 per cent of the requirements of melters in this territory This contracting has been spread out to such an extent that it has failed to make the impression which would have been made had it all been concentrated in one brisk buying movement. Active merchant furnaces in this district are shipping all they are producing and at the same time are slowly reducing their accumulated stocks. The point has by no means been reached, however, when the blowing in of additional furnaces is contemplated. Over the Northern border, the Soo producer is putting in an additional furnace today, giving it three active stacks out of a total of four, but this action was probably necessitated by increased steel bookings rather than heavier merchant iron business. Southern iron is firm at $23 base, Birmingham, with few sales in this section. A local melter has closed for 200 tons for prompt shipment at that price and another Chicago user has contracted for 2000 tons for second quarter shipment. A Wisconsin melter is inquiring for 500 tons of malleable for second quarter. Western Michigan users have closed for 1000 tons of malleable and 800 tons of foundry respectively for second quarter. A Michigan automobile manufacturer is inquiring for 2000 tons of 14 to 16 per cent silvery. The most recent sale of low phosphorus for local use brought out a price of approximately $33 delivered; an inquiry for a plant on the Eastern seaboard developed a quotation of $27 delivered. A Michigan consumer has closed for 500 tons of charcoal for second quarter. In some quarters there is apprehension lest the Teapot Dome investigation at Washington will have a depressing effect on business. The general consensus of opinion, however, is that the policies of purchasing agents will not show any appreciable change unless the probe results in a sustained decline in the stock market.

Quotations on Northern foundry high phosphorus malleable and basic irons are f.o.b. local furnace and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumer's yard or, when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago..	$29.15
Northern coke, No. 1, sil. 2.25 to 2.75	25.00
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	24.50
Malleable, not over 2.25 sil.	24.50
Basic	24.50
High phosphorus	24.50
Southern No. 2	$29.01 to 29.51
Low phos., sil. 1 to 2 per cent, copper free	33.00 to 34.29
Silvery, sil. 8 per cent	38.29

Ferroalloys.—Ferromanganese is steady at $107.50, seaboard. Two carlot sales have been made at that price. Domestic producers of spiegeleisen have reduced their prices to meet foreign competition. From $37 to $38 domestic furnace appears to be the ruling market, the lower figure applying on quantities. A local melter has closed for 200 tons.

We quote 80 per cent ferromanganese, $115.06, delivered; 50 per cent ferrosilicon, $75, delivered; spiegeleisen, 18 to 22 per cent, domestic, $45.58 to $46.58, delivered; foreign, $44.56, delivered.

Plates.—Railroad car buying continues to be the main source of plate tonnage, although an encouraging volume of business is coming from miscellaneous sources. A Southwestern tank fabricator has placed an order with a local mill for 1000 tons of plates for small tank construction.

The mill quotation is 2.60c., Chicago. Jobbers quote 3.30c. for plates out of stock.

Bars.—Heavy demand for soft steel bars is the outstanding feature of the market. Orders are coming from both small and larger users and in some cases buyers are overspecifying their first quarter contracts. For example, one consumer who had ordered 15,000 tons, has actually specified 20,000 tons. Mills east of here continue to book orders for certain sizes on which deliveries from Chicago mills have been retarded, but the tonnage involved in these transactions is not yet large. Buying of bar iron, in contrast with soft steel, shows little, if any, expansion. The Republic Iron & Steel Co. has adopted the same extras on bar iron for cutting to specified lengths, other than machine cutting, that apply to soft steel bars. Formerly an extra of 1/10 of 1c. per 100 lb. was asked for cutting to all lengths over 48 in. Under the new extra card, cutting to lengths over 48 in. to 60 in. inclusive takes an extra of 1/10 of 1c., cutting to lengths over 60 in. to, but not including 120 in., takes an extra 1/20 of 1c., while all lengths of 120 in. and over are cut without charge. Demand for rail steel bars continues to show gradual improvement.

Mill prices are: Mild steel bars, 2.50c., Chicago; common bar iron, 2.40c., Chicago; rail steel, 2.30c., Chicago mill.

Jobbers quote 3.20c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting is 4c. for rounds and 4.50c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 2.75c. to 3c. base; hoops, 4.45c.; bands, 3.95c.

Bolts and Nuts.—Specifications are showing moderate improvement in the aggregate, being liberal so far as the automobile industry is concerned, but still of limited volume from the jobbers. On new business the advanced quotations are being applied to a greater extent than heretofore, but the old discounts still represent the ruling market.

Jobbers quote structural rivets, 3.75c.; boiler rivets, 3.95c.; machine bolts up to ⅞ x 4 in., 55 and 5 per cent off; larger sizes, 55 and 5 off; carriage bolts up to ⅞ x 6 in., 50 and 5 off; larger sizes, 50 and 5 off; hot pressed nuts, squares and hexagons, tapped, $3.50 off; blank nuts, $3.50 off; coach or lag screws, gimlet points, square heads, 60 and 5 per cent off.

Sheets.—Specifications are heavy and new inquiry points to a further increase in sheet consumption as

spring approaches. Prices are steady, indicating that mills are comfortably booked. Such shading as is still being done on black and galvanized is of an exceptional character. The local independent expects to open its books for second quarter next week.

Mill quotations are 3.85c. for No. 28 black, 3c. for No. 10 blue annealed and 5c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote f.o.b. Chicago: 4c. for blue annealed; 4.70c. for black and 5.85c. for galvanized.

Cast Iron Pipe.—Demand is active with prices gathering strength. While some makers are holding to a minimum quotation of $48, Birmingham, on 12-in. and over and $49 to $50 base, Birmingham, on smaller sizes, as low as $47.50 base is still being done in some instances. Lettings include:

Chicago, 670 tons to James B. Clow & Sons.

Rockford, Ill., 500 tons to United States Cast Iron Pipe & Foundry Co.

Rochester, Minn., 300 tons to American Cast Iron Pipe Co.

Washington, Ind., 100 tons to National Cast Iron Pipe Co.

Faribault, Minn., 120 tons to National Cast Iron Pipe Co.

Pending business includes:

Montgomery County, Dayton, Ohio, 2220 tons, general contractors' bids to be taken Feb. 20.

Highland Park, Mich., 320 tons of 8- and 12-in., bids to be in Feb. 18.

Hammond, Ind., 125 tons of 4- and 6-in., Feb. 20.

Jackson, Mich., 200 tons, Feb. 19.

Marion, Ind., 140 tons, Feb. 21.

Youngstown, Ohio, 800 tons.

Illinois Golf Club, Glencoe, Ill., 175 tons.

Duluth, Minn., 1200 tons of gas and water pipe, Lynchburg Foundry Co. low bidder.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $60.20 to $61.20; 6-in. to 10-in., inclusive, $56.20 to $57.20; 12-in. and above, $55.70 to $56.20; class A and gas pipe, $5 extra.

Rails and Track Supplies.—Recent concessions in track supplies have failed to result in formal price reductions. New business during the week has been confined to miscellaneous small lots. One road bought 2000 tons of tie plates, another placed 3000 kegs of spikes and a third closed for 1400 kegs of bolts. The Nickel Plate's inquiry for 4000 tons of tie plates is still pending.

Standard Bessemer and open-hearth rails, $43; light rails, rolled steel, 2.25c., f.o.b. makers' mills.

Standard railroad spikes, 3.10c. mill; track bolts with square nuts, 4.10c. mill; steel tie plates, 2.60c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.75c. base, and track bolts, 4.75c. base.

Wire Products.—Heavier specifications are being received from the jobbers, although as a class they are still holding back their orders on the theory that nothing is to be gained by buying ahead so long as price advances are not imminent and transportation conditions are satisfactory. Demand for nails is reasonably active and business in poultry netting is good, while inquiry for barbed wire, which had been lagging, is reviving. Orders for woven wire fence are fair. Demand for wire products from manufacturing consumers is still heavier than from jobbers. Mill operations range from 75 to 80 per cent. For mill prices, which are unchanged, see finished iron and steel, f.o.b. Pittsburgh, page 614.

We quote warehouse prices f.o.b. Chicago: No. 6 to No. 9 bright basic wire, $3.90 per 100 lb.; extra for black annealed wire, 15c. per 100 lb.; common wire nails, 3.65c. to 3.80c. per 100 lb.; cement coated nails, 3.10c. to 3.25c. per keg.

Structural Material.—Demand for plain material is active and while most orders are for definite fabricating jobs, a fair tonnage has been placed for stock, one order for stock amounting to 1200 tons. Building activity progresses at a steady pace with lettings up to the average and inquiries in good volume. Figures taken on the general contract for the Snelling-Mendota Bridge, Minneapolis, show the Koss Construction Co., Des Moines, as low bidder on the all reinforced concrete design, calling for 3000 tons of concrete bars, and Grailing Brothers, Green Bay, Wis., as low bidder on the structural steel design, involving 8100 tons of plain material. Incidentally the latter bid was the lower of the two. Final action has not yet been taken on the New Palmer House, Chicago, requiring 17,000 tons. The Buhl Building, Detroit, involving 5500 tons, was divided between two fabricators. The Stevens Hotel Building, Chicago, an old project calling for 17,000 tons, has been revived with the probability that new bids will be taken soon.

The mill quotation on plain material is 2.60c., Chicago. Jobbers quote 3.30c. for plain material out of warehouse.

Reinforcing Bars.—There has been a recovery in lettings and considerable new prospective work has come up for bids or is rapidly approaching that stage. At the same time, the price situation is substantially unchanged, with Chicago warehouse prices ranging from 2.75c. to 3c. per lb. Lettings include:

Columbia Gas & Electric Co. power station, Cincinnati, 900 tons to Bourne-Fuller Co.

S. D. Childs & Co., printing plant, Chicago, 300 tons to Joseph T. Ryerson & Son.

Security Trust & Savings Bank building, Chicago, 150 tons to Kalman Steel Co.

Roosevelt Road viaduct for City of Chicago, 115 tons to Joseph T. Ryerson & Son.

Hotel at Henderson, Ky., 120 tons of rerolled bars to Pollak Steel Co.

Illinois state road work, 100 tons to Joseph T. Ryerson & Son.

Pending business includes:

Indiana state road work, 1130 tons, general contracts awarded.

Standard Sanitary Mfg. Co., brass finishing building, Louisville, Ky., 900 tons.

Chicago & North Western Railway, first half of requirements, 500 tons.

Scoville Mfg. Co., Chicago warehouse, 135 tons.

Kimball Trust & Savings Bank building, 100 tons, general contract awarded to Bulley & Andrews, Chicago.

Riding Club building, Chicago, 100 tons, general contract awarded to Bulley & Andrews, Chicago.

University of Illinois, four college buildings, Urbana, Ill., 400 tons, general contract awarded to English Bros., Champaign, Ill.

Old Material.—Consuming interests have bought a considerable tonnage of railroad malleable and low phosphorus scrap during the week, all grades bringing $22 per gross ton delivered. Orders for cast scrap were placed at a concession under recent ruling prices. On the whole, however, the market is stronger, with various low phosphorus grades 50c. up and a number of miscellaneous items higher. Heavy melting remains unchanged, although small tonnage have been sold at 50c. above the market. The heavier sections of relaying rail have declined. Railroad offerings include the Louisville & Nashville, 8400 tons and the Soo Line, 400 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Iron rails	$21.00 to $21.50
Cast iron car wheels	21.50 to 22.00
Relaying rails, 56 and 60 lb.	26.00 to 27.00
Relaying rails, 65 lb. and heavier	27.00 to 32.00
Forged steel car wheels	22.00 to 22.50
Railroad tires, charging box size	22.00 to 22.50
Railroad leaf springs, cut apart	22.00 to 22.50
Rails for rerolling	20.50 to 21.00
Steel rails, less than 3 ft.	22.00 to 22.50
Heavy melting steel	18.00 to 18.50
Frogs, switches and guards cut apart	19.50 to 20.00
Shoveling steel	17.75 to 18.25
Drop forge flashings	14.00 to 14.50
Hydraulic compressed sheets	15.25 to 15.75
Axle turnings	16.50 to 17.00
Steel angle bars	20.50 to 21.00
Steel knuckles and couplers	22.00 to 22.50
Coil springs	23.00 to 23.50
Low phos. punchings	19.50 to 20.00
Machine shop turnings	12.50 to 13.00
Cast borings	15.50 to 16.00
Short shoveling turnings	15.50 to 16.00
Railroad malleable	22.00 to 22.50
Agricultural malleable	21.00 to 21.50

Per Net Ton

Iron angle and splice bars	20.50 to 21.00
Iron arch bars and transoms	20.50 to 21.00
Iron car axles	29.50 to 30.00
Steel car axles	20.50 to 21.00
No. 1 busheling	15.00 to 15.50
No. 2 busheling	11.00 to 11.50
Cut forge	16.50 to 17.00
Pipes and flues	12.00 to 12.50
No. 1 railroad wrought	15.50 to 16.00
No. 2 railroad wrought	16.50 to 17.00
No. 1 machinery cast	21.00 to 21.50
No. 1 railroad cast	19.50 to 20.00
No. 1 agricultural cast	19.50 to 20.00
Locomotive tires, smooth	18.00 to 18.50
Stove plate	17.00 to 17.50
Grate bars	16.00 to 16.50
Brake shoes	18.00 to 18.50

New York

Car Orders Involve 300,000 Tons of Steel—Radiator Company Buys Pig Iron

NEW YORK, Feb. 19.—The American Radiator Co. has purchased 25,000 tons of foundry grades for delivery at various plants in the second quarter, including 3000 tons for Springfield, Ohio. It is understood that most of the tonnage will come from Buffalo furnaces, but some of it from the Mahoning Valley. Exclusive of the Radiator purchase, which can not be credited to New York salesmen, sales last week amounted to about 20,000 tons, but inquiries have dropped to only 3000 or 4000 tons and the market is very quiet at the present time. The prevailing price at Buffalo is $22 for No. 2 plain and $23 is the ruling quotation in eastern Pennsylvania. Some shipments of foreign iron have been made to Boston, but the tonnage is not large. Semi-phosphorus foundry iron (more than 1 per cent phosphorus) has advanced and the iron lower in phosphorus is now on a more competitive basis than the high phosphorus. One company is quoting $24.25 to $24.50 per ton, c.i.f. Atlantic port, duty paid, on a Dutch iron less than 1 per cent phosphorus and 2.25 to 2.75 per cent silicon. Delivered to New England to foundries near to Boston, this is a competitive price. Some German foundry iron is being offered at about 25c. per ton more than the Dutch.

We quote delivered in the New York district as follows, having added to furnace price $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1X fdy., sil. 2.75 to 3.25	$26.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	25.77
East. Pa. No. 2, sil. 1.75 to 2.25	25.27
Buffalo, sil. 1.75 to 2.25	26.91
No. 2X Virginia, sil. 2.25 to 2.75	30.44
No. 2 Virginia, sil. 1.75 to 2.25	31.44

Ferroalloys.—There is very little inquiry for ferromanganese and reported sales cover only carload and small lots for early delivery. There is no change in the price situation and almost no shading of the recently established quotation of $107.50, seaboard. Demand for spiegeleisen is also light and prices are unchanged at $38 to $40, furnace, for the higher grade. No developments are noted in the manganese ore, 50-per cent ferrosilicon or standard ferrochromium market.

Cast-Iron Pipe.—Demand from private companies for spring delivery continues strong, but few municipalities in the New England district have thus far issued tenders. Probably the chief tonnage of interest in this district is the contract to be let by the Department of Water Supply, Gas and Electricity, New York, involving about 2000 tons of 20-in. and 36-in. pressure pipe, bids opening Feb. 26. Prices are firm and unchanged. The City of Philadelphia is expected to issue a tender for a fair sized tonnage of water pipe. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $61.60 to $63.60; 4-in. and 5-in., $66.60 to $68.60; 3-in., $76.60 to $78.60, with $5 additional for Class A and gas pipe. A fair demand for soil pipe from jobbers specifying spring delivery as late as May 1 is noted by makers. Prices are firm and discounts unchanged. We quote discounts of both Southern and Northern makers as follows: 6-in., 29½ to 30¾ per cent off list; heavy, 39½ to 40¾ per cent off list.

Finished Iron and Steel.—Railroad lettings of cars, together with orders in prospect, offer the most hopeful sign this week of improving demand for the major steel products. The 6000 cars ordered by the Norfolk & Western Railroad will take 100,000 tons of steel, inclusive of axles. There are other inquiries and orders from both Eastern and Western roads. The New York Central and Pennsylvania are expected to place large orders this week that will require 200,000 tons or more of steel. Car buying may serve to take up some of the slack in the lettings of steel for building construction, a falling off in such steel work having been quite noticeable in the last two weeks. Eastern plate mills are competing very actively for orders with some concessions in prices. Lots of a carload or 100 tons have commanded quotations as low as 2.30c., Pittsburgh, and on 1800 tons of car plates the price was not above 2.29c., Pittsburgh. Small lots are being sold at 2.35c. and 2.40c. Structural shapes show a slightly firmer tendency than plates, but 2.40c., Pittsburgh, is still quite freely quoted on standard shapes. Bars are firm at 2.40c., Pittsburgh, but there are occasional concessions on concrete reinforcing bars. Warehouses specializing in concrete bars, however, have advanced their prices, now quoting on the basis of 2.65c., Pittsburgh. An improvement in the demand for reinforcing bars has been gradual since the first of the year. The largest job pending is for a sewer in Brooklyn, requiring 1600 tons.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.74c.; plates, 2.64c. to 2.74c.; structural shapes, 2.74c. to 2.84c.; bar iron, 2.74c.

Warehouse Business.—Business is reported to be particularly good for this season and despite the fact that February is a short month with two holidays, it seems to be expected that it will prove as good a month for volume of orders as January. In general, prices are unchanged. Black and galvanized sheets have been advanced by most warehouses and the minimum quotation is now 4.85c. and 5.85c. per lb. base for black and galvanized respectively. Shading of these prices is said to be almost negligible. Prices of brass and copper products are strong, with an upward tendency. Sellers of wrought iron and steel pipe report a fairly large volume of inquiry for spring construction. We quote prices on page 632.

Coke.—Standard furnace coke continues firm, with the market ranging from $4.25 to $4.50 per ton. Standard foundry has also stiffened slightly as a result of increased demand and while $5 per ton could probably still be done on carload lots for prompt shipment, $5.25 to $5.75 per ton are the more common quotations. By-product is quoted at $10.91, Newark and Jersey City, N. J.

Old Material.—The market has dropped off slightly, with little or no buying by consumers. Dealers and brokers are paying $17.50 to $18 per ton delivered eastern Pennsylvania for heavy melting steel. The present dullness is partly attributed to recent heavy purchases by brokers, which were shipped to consumers' works and eventually taken in at less than had been expected. Specification pipe is also weak, $17.50 per ton delivered being about the best price obtainable today from dealers with contracts. Stove plate continues fairly firm at $17 per ton delivered Harrisburg, Pa., or to foundries in New Jersey taking a lower freight rate, $16.50 per ton. Borings and turnings are still bringing $15 per ton delivered eastern Pennsylvania. Despite the present decline there is evident a tone of optimism.

Buying prices per gross ton New York follow:

Heavy melting steel, yard	$14.00 to $14.50
Steel rails, short lengths, or equivalent	14.25 to 14.75
Rails for rolling	18.00 to 18.50
Relaying rails, nominal	25.00 to 26.00
Steel car axles	18.00 to 19.00
Iron car axles	25.00 to 26.00
No. 1 railroad wrought	17.50 to 18.00
Forge fire	11.50 to 12.00
No. 1 yard wrought, long	15.00 to 16.00
Cast borings (clean)	11.25 to 11.75
Machine-shop turnings	11.75 to 12.25
Mixed borings and turnings	11.50 to 12.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)	13.00 to 13.50
Stove plate	13.50 to 14.50
Locomotive grate bars	14.50 to 15.00
Malleable cast (railroad)	16.00 to 17.00
Cast iron car wheels	16.50 to 17.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$20.00 to $21.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	19.00 to 20.00
No. 1 heavy cast, not cupola size	15.50 to 16.50
No. 2 cast (radiators, cast boilers, etc.)	17.00 to 18.00

The Winton Co., Cleveland, for many years engaged in the manufacture of automobiles, has discontinued making cars and is liquidating its automobile business. Negotiations for the sale of its plant are under way. The company will continue the operation of its engine plant where it is engaged in the manufacture of Diesel type engines.

Buffalo

Radiator Company Buys 25,000 Tons of Pig Iron—More Interest in Finished Material

BUFFALO, Feb. 19.—The principal transaction of the week was the purchase of 25,000 tons by the American Radiator Co. for various plants for second quarter. Total inquiries as noted by one company were 20,000 tons of foundry and malleable, including one for 5000 tons of foundry. Another seller noted that of the inquiries three for foundry totaled 6000 tons and four or five for malleable—5000 tons. Inquiries covered a general line of consumption, but indicate that the heating appliance manufacturers are going to have a better year in 1924 than in 1923, despite the fact that last year was considered extraordinarily good. Among the sales made here for a Birmingham furnace for delivery to a radiator manufacturing plant in the South was 1500 tons of foundry grades at $23 base. Originally 3000 tons was sought, but this inquiry tapered to half size. Prices are established at $22 base for No. 2 plain, 1.75 to 2.25 silicon for second quarter and $23 base for the same foundry grade for first quarter delivery. One maker, however, who is sold through till April announces nothing less than $23 for second quarter on No. 2 plain with $23.50 for 2.25 to 2.75 silicon and $24 for 2.75 to 3.25 silicon. No basic is being sold at the present time, but the nominal price for this iron is $23. The $22 price for first quarter is firm and makers say is likely to strengthen. Total selling has been in the neighborhood of 15,000 tons, one maker having booked 8000 tons. Bethlehem's Lackawanna plant is temporarily out of the market for any delivery. The Lackawanna plant has increased its operations to seven blast furnaces. All furnace interests in the market say they are obtaining the 50c. differential for 2.20 to 2.75 silicon and $1 for each 50 points above that.

We quote f.o.b., gross ton, Buffalo as follows:

No. 1 foundry, sil. 2.75 to 3.25	$23.50 to $24.50
No. 2 foundry, sil. 2.25 to 2.75	22.50 to 23.50
No. 2 plain, sil. 1.75 to 2.25	22.00 to 23.00
Basic	22.00 to 23.00
Malleable	22.00 to 23.00
Lake Superior charcoal	29.28

Finished Iron and Steel.—Mills report a steady and increasing interest in finished lines. Prices in general are firm. A substantial building program is either coming out or is in prospect for early spring. Preliminary sounding is being done for the new Liberty bank building which will be about 20 stories and will require considerable structural material. Bids are in order on the Stanley building, 250 tons, Erie, Pa., and another building in the same city which will require 400 tons. Bids have been taken for Niagara Falls, Lockport & Ontario power line towers requiring 900 tons. January was a very good month with structural mills and February is expected to be better. A local seller of butt weld pipe reports one of the best weeks in months, good as the pipe business has been. Jobbers are specifying heavily and are crowding mills for shipment. Sheet makers had a good week, booking several hundred tons. The price is fairly firm at 3.85c. for black and 5c. for galvanized, though some slipping to 3.75c. and 4.90c. is noted. A recent order for Canadian delivery was for 8000 tons of sheets to be galvanized in Canada. The Steel Co. of Canada, Ltd., received part of the contract and an American mill participated. The starting Monday of a Lackawanna plate mill placed all mills in this Bethlehem plant in operation; the plant already has about 80 per cent open-hearth operation. Wickwire-Spencer operation has been at 100 per cent for a week.

We quote warehouse prices Buffalo as follows: Structural shapes, 3.65c.; plates, 3.65c.; soft steel bars, 3.55c.; hoops, 4.65c.; bands, 4.35c.; blue annealed sheets, No. 10 gage, 4.30c.; galvanized steel sheets, No. 28 gage, 6.10c.; black sheets, No. 28 gage, 5c.; cold rolled round shafting, 4.45c.

Old Material.—The market here continues strong though for the time being mills are out of the market. They are expected to resume buying within a week or two, but in the interval dealers are purchasing in a lively manner. Shippers are impressed with the rapid despatch given shipments, and point out that the railroad situation is so far the best in many winters. A little congestion has occurred on Youngstown shipments, but thus far this has been the exception in the orderly routing of old material. Not much material is coming out and stocks in dealers' yards are not heavy. Youngstown and Pittsburgh points have been taking the recent railroad offerings. In each one of the last three buying movements, the market has stiffened without receding later. The entire list including the specialties are active and prices are firm throughout.

We quote f.o.b., gross ton, Buffalo, as follows:

Heavy melting steel	$20.50 to $21.00
Low phos., 0.04 and under	24.00 to 25.00
No. 1 railroad wrought	18.00 to 19.00
Car wheels	20.50 to 21.00
Machine shop turnings	14.00 to 14.50
Cast iron borings	14.50 to 15.00
No. 1 busheling	19.00 to 19.50
Stove plate	18.00 to 18.50
Grate bars	17.50 to 18.00
Bundled sheet stampings	14.50 to 15.00
Hydraulic compressed	19.00 to 19.50
Railroad malleable	22.00 to 23.00
No. 1 machinery cast	20.00 to 20.50

St. Louis

Pig Iron Firm—4,000 Ton Basic Sale the Principal Transaction

ST. LOUIS, Feb. 19.—The market for pig iron continues firm, although there is very little buying. Melters in this district seem to be well supplied with material for the first quarter, and they are not showing any interest to speak of in second-quarter requirements. One of the reasons for that is the size of the order files, which do not justify any extensive buying of pig iron at this time. The principal sale of the week—4000 tons of basic to an East Side melter—was made by the St. Louis Coke & Iron Co. The most important inquiry comes from a specialty manufacturer, with plants on both sides of the Mississippi River, and is for 8000 to 10,000 tons of foundry iron for second quarter delivery. Two other inquiries are for 400 and 500 tons respectively. The Granite City maker is quoting $25.50 to $26, f.o.b. furnace. Northern iron is $24 to $24.50, Chicago, and Southern $23 to $24.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $3.28 from Birmingham (rail and water), $5.17 from Birmingham, all rail, and 81 cents average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$26.16 to $26.66
Northern malleable, sil. 1.75 to 2.25	26.16 to 26.66
Basic	26.16 to 26.66
Southern fdy., sil. 1.75 to 2.25 (rail)	28.17 to 29.17

Finished Iron and Steel.—A better demand is reported for most items in finished iron and steel, with the exception of tank plates. No one sale of consequence has been made, but the volume in small orders is reported to be fair. Sheets is one of the items showing improvement. Railroad inquiries are confined for the present to carload lots.

For stock out of warehouse we quote: Soft steel bars, 3.35c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold-rolled, one pass, 4.85c.; cold drawn rounds, shafting and screw stock, 4.70c.; structural rivets, 4.15c.; boiler rivets, 4.35c.; tank rivets, $\frac{7}{8}$-in. and smaller, 50-5 per cent off list; machine bolts, 45-5 per cent; carriage bolts, 40-5 per cent; lag screws, 50-5 per cent; hot pressed nuts, squares or hexagons blank, $2.50, and tapped, $2.50 off list.

Coke.—Warmer weather put a crimp into what little demand there was for domestic grades. Only a small amount of foundry coke is being sold, and that is being supplied by by-product ovens in the district, little coming from the Pennsylvania fields.

Old Material.—More sales and still more inquiries during the week have added strength to the market for old material. It was still a dealers' market, but the feeling is strong that consumers of both melting and rolling mill grades will be in the market heavily soon. Railroad lists closing last week brought high prices. New lists include: Louisville & Nashville, 8500 tons, and San Antonio & Aransas Pass Railway, 7300 tons.

The latter offering represents the first sale this road will have made in three years.

Per Gross Ton

Iron rails	$18.00 to $18.50
Rails for rolling	19.50 to 20.00
Steel rails, less than 3 ft.	20.00 to 20.50
Relaying rails, 60 lb. and under	25.00 to 26.00
Relaying rails, 70 and over	32.50 to 33.50
Cast iron car wheels	21.00 to 21.50
Heavy melting steel	17.50 to 18.00
Heavy shoveling steel	17.00 to 17.50
Frogs, switches and guards cut apart	19.00 to 19.50
Railroad springs	21.50 to 22.00
Heavy axles and tire turnings	14.00 to 14.50

Per Net Ton

Steel angle bars	16.50 to 17.00
Steel car axles	20.50 to 21.00
Iron car axles	27.00 to 27.50
Wrought iron bars and transoms	22.00 to 22.50
No. 1 railroad wrought	16.50 to 17.00
No. 2 railroad wrought	16.00 to 16.50
Cast iron borings	11.50 to 12.00
No. 1 busheling	15.50 to 16.00
No. 1 railroad cast	19.50 to 20.00
No. 1 machinery cast	19.50 to 20.00
Railroad malleable	17.00 to 17.50
Machine shop turnings	10.50 to 11.00
Champion bundled sheets	10.50 to 11.00

Birmingham

Pig Iron Prices Firm—Cast Iron Pipe Orders Are Numerous

BIRMINGHAM, ALA., Feb. 19.—While no large tonnage sales were announced during the past week the pig iron market, with numerous small lot sales, including some spot business, continues strong. Smaller furnace interests are maintaining $24 per ton for No. 2 foundry. The Alabama Co., with machine-cast and special brand iron, selling freely in comparison to its make, which it intends to increase, has been selling in small lots at $24. One or two other furnace interests have sold small tonnages also for second quarter delivery at $23.50, and one of the larger producing companies has been selling at $23. The greater portion of the business recently booked by the furnace interests in this district has been for April and May delivery, though some tonnage will extend into June and July. Delivery of pig iron continues prompt.

We quote per gross ton f.o.b. Birmingham district furnace as follows:

Foundry, silicon, 1.75 to 2.25	$23.00
Basic	23.00
Charcoal, warm blast	33.00

Cast-Iron Pipe.—The cast-iron pipe industry is enjoying a splendid business. The United States Cast Iron Pipe & Foundry Co., as well as the American and National companies here, has done more business during the first two months of this year than the same period last year. Shipments are steady, in every direction west of the Mississippi and Ohio rivers. The American Cast Iron Pipe Co. announces following lettings recently: 187 tons for Marinette, Wis.; 294 tons for Holdeb, Mo.; 163 tons for Columbus, Ohio; 100 tons for Rockingham, N. C. Cast-iron pipe prices have taken on additional strength, 6-in. and over, Birmingham, being quoted at $48 to $49; 4-in. and over, Birmingham, $52 to $53, while 16-in. and over is quoted at around $47 to $48. Sanitary pipe plants are melting iron steadily and are shipping the product as quickly as being manufactured. The Birmingham Machine & Foundry Co., now with two pipe shops, has been producing around 100 tons of pipe and fittings daily, additions having been made to the pipe-making shops.

We quote: 4-in. water, $52 to $53; 6-in., $48 to $49; larger sizes, $47 to $48; 4-in. gas, $56; 6-in., $52; standard sanitary pipe, $55; heavy gage, $45.

Finished Steel.—No evidence is in sight in this district of a hold-up in steel products, wire, nails or other shapes. Some of the Southern railroads are urging delivery on rails ordered last year. A shipment of around 75 cars of steel rail in one day from the Ensley plant was noted this week. Additional business in rail making was allocated to this district the past week by the United States Steel Products Co. Steel fabricating plants are receiving new business. The Virginia Bridge & Iron Co. has received the specifications for the steel to be used in the development of the Finley yards of the Southern Railway at North Birmingham. Among the buildings to be erected will be car works and locomotive erecting shops. About 4000 tons of steel will be used. The Ingalls Iron Works Co. has three or four new jobs the past two weeks, including the theater in Pensacola requiring 255 tons of steel and a couple of bridges. Steel bars are still quoted around 2.55c. to 2.60c., Birmingham.

Coke.—Southern coke is in better demand, but the quotations show no change, beehive product holding at $5.50 and the by-product foundry coke to be had as low as $5, though the average is from $5.50 to $6.50. Production is equal to demand. Furnace interests are able to increase their by-product coke production just as needed, more or less repairing being done about the big plants.

Scrap.—The scrap iron and steel market trend is upward, though quotations show no new readjustment. Stocks on yards of the dealers in old material are being kept up. Heavy melting steel is still down below $15.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Cast iron borings, chemical	$16.00
Heavy melting steel	$14.00 to 15.00
Railroad wrought	12.00 to 13.00
Steel axles	19.00 to 20.00
Iron axles	20.00
Steel rails	12.00 to 13.00
No. 1 cast	19.50 to 20.00
Tram car wheels	18.00 to 19.00
Car wheels	13.00 to 14.00
Stove plate	16.50 to 17.00
Machine shop turnings	7.00 to 9.00
Cast iron borings	9.00 to 10.00

Boston

Comparatively Little Pig Iron Business Booked in New England the Past Week

BOSTON, Feb. 19.—Comparatively little pig iron business was booked the past week, and almost all of it obtained by personal solicitation, there being no open inquiries for more than car lots. Buffalo, western Pennsylvania and eastern Pennsylvania irons lead in activity, in the order given. The market apparently is maintaining the recovery in prices noted a week back, but sentiment among sellers is less optimistic. The feeling persists that the next buying movement will not come until late in the second quarter. Certain foundries report a falling off in business, while others are more active. Collectively, the industry is doing better. It now develops a Massachusetts heater manufacturer recently purchased 2100 tons of No. 2 plain iron from four furnaces on a basis equivalent to less than $22 furnace, Buffalo, and less than $22.50 eastern Pennsylvania, delivery extending into the second quarter.

We quote delivered prices on the basis of the latest reported sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia, and $9.60 from Alabama:

East. Penn. sil. 2.25 to 2.75	$27.15 to $27.40
East. Penn., sil. 1.75 to 2.25	26.65 to 26.90
Buffalo, sil. 2.25 to 2.75	27.41 to 28.41
Buffalo, sil. 1.75 to 2.25	26.91 to 27.91
Virginia, sil. 2.25 to 2.75	31.42 to 32.42
Virginia, sil. 1.75 to 2.25	30.92 to 31.92
Alabama, sil. 2.25 to 2.75	33.10
Alabama, sil. 1.75 to 2.25	32.60

Warehouse Business.—The demand for cold-drawn steel is more active than it has been in months. The movement of other material out of warehouses continues well in excess of that for the corresponding period last year. The open winter, making possible outside work, is largely responsible for the condition of business. Warehouse stocks in most cases are comfortably large and well assorted.

Soft steel bars, $3.51½ per 100 lb. base; flats, $4.40; plain and deformed concrete bars, $3.76½; small angles, channels and tees, $3.51½; structural steel, large angles and beams, $3.61½; tire steel, $4.80 to $5.15; open-hearth spring steel, $5 to $8; crucible spring steel, $12; steel bands, $4.31½ to $5.20; hoop steel, $5.80 to $6.30; cold rolled steel, $4.35 to $4.85; toe calk steel, $6.15; heavy plates, $3.61½; light plates, $3.86½; diamond pattern plates, stock sizes, $5.90; blue annealed sheets, $4.51½; refined iron bars, $3.51½; best refined iron bars, $4.75; Wayne, $5.50; Norway rounds, $6.60; Norway squares and flats, $7.10.

Coke.—The general New England coke situation, which a month ago was unsettled, due to the accumulation of surplus stocks at ovens, has been further strengthened by a sizable demand for domestic sizes, as well as by an improvement in the movement of foundry fuel. Both the New England Coal & Coke Co. and the Providence Gas. Co. continue to quote $12.50, delivered, on specifications against first half foundry coke contracts.

Old Material.—Brokers having ceased speculating, and business simmered down to the orderly execution of contracts, the old material market on the surface appears quieter than it really is. Much of the recent buying has been against contracts obtained some time previous, and largely confined to heavy melting steel for eastern Pennsylvania shipment. A decrease in rejections and a willingness by those few making rejections to accept material at price concessions have restored confidence among the trade. Included in the past week's business are round tonnages of pipe, long wrought equivalent to No. 1 railroad wrought, cotton ties, borings and turnings, practically everything for Pennsylvania shipment. Borings and turnings, however, are less active than other materials mentioned. New England foundries continue to show little interest in machinery cast. Most of the small lots sold recently were at or close to $22, delivered.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$22.00 to $22.50
No. 2 machinery cast	20.00 to 20.50
Stove plates	15.50 to 16.50
Railroad malleable	19.00 to 19.50

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$14.00 to $15.25
No. 1 railroad wrought	14.50 to 15.00
No. 1 yard wrought	12.50 to 13.00
Wrought pipe (1-in. in diam., over 2 ft. long)	12.50 to 13.00
Machine shop turnings	11.50 to 12.00
Cast iron borings, chemical	12.00 to 12.50
Cast iron borings, rolling mill	11.00 to 11.75
Blast furnace borings and turnings	11.00 to 11.75
Forged scrap and bundled skeleton	10.50 to 11.00
Shafting	17.50 to 18.50
Street car axles	17.50 to 18.00
Rails for rolling	15.50 to 16.00

Cincinnati

Ironton Market Softens—Radiator Company Places Tonnage

CINCINNATI, Feb. 19.—The pig iron market was rather quiet during the past week, the only tonnage of consequence being 3000 by the American Radiator Co. for its Springfield, Ohio, plant. Other sales of Northern include several of Buffalo iron at $22, Buffalo and southern Ohio resale at $23.50, and furnace iron at $24. The Ironton market is quoted nominally at $24, but on attractive tonnages it is said that 50c. less would be considered. Outside competition in the extreme Northern part of the territory is also being met, and it would seem that a quotation of more than $23.50 is not justified. Practically all Alabama furnaces are quoting $23 to $24 for first and second quarters, but Southern iron can still be obtained at $22.50 base from Tennessee furnaces, and a sale of 500 tons at that figure was made last week. Generally speaking, the demand for Southern iron is light, as the price is high compared with Northern brands. Small sales of silveries and charcoal at the schedule are reported. There is little activity in Bessemer and none in basic iron in this district.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$26.55
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	27.05
Ohio silvery, 8 per cent	35.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	25.77
Basic Northern	25.27
Malleable	25.77

Fluorspar.—A dip in prices of fluorspar last week brought in some business, but prices have now returned to previous levels. The market is rather quiet. Some of the smaller operators are quoting from $1 to $2 under the market, but are unable to move materials owing to conditions of roads from mines to railroads. Mining operations are becoming more costly and fluorspar is expected to take a sharp advance, as supply is expected to be scarce.

Reinforcing Bars.—The Foundation Co. has awarded 1400 tons of reinforcing bars for the power plant of the Union Gas & Electric Co. to the Bourne-Fuller Co. New projects involve considerable tonnage. The Brown Theater, Louisville, will take approximately 600 tons; the Alms Hotel, Cincinnati, 700 tons; Heyburn office building, Louisville, estimated 1000 tons; Nash Tailoring Co., Cincinnati, 500 tons; and a municipal building at Bluefield, W. Va., 200 tons.

Sheets.—Demand for sheets is very active, and some large orders were placed at the regular price schedule during the past week. It is still possible to secure black sheets at 3.75c. and galvanized sheets at 4.90c. from some of the smaller mills needing tonnages, but the general tendency is toward firmness in quotations.

Structural Activity.—Chief interest centered in the award of the Rigolets bridge by the L. & N. Railroad. This project, involving 6500 tons, will be fabricated and erected by the American Bridge Co. The Lukens Steel Co. will fabricate 1400 tons at New Orleans for the L. & N. warehouse at that point.

Finished Materials.—The demand for finished materials runs mostly to carload orders for prompt shipment, but the number of orders being placed indicates considerable activity in manufacturing plants. Implement manufacturers in this district were fairly good buyers during the past week, placing orders for hot- and cold-rolled bars. Boiler and tank manufacturers report business as rather quiet, though inquiries are fairly numerous. Plates are moving in fair volume, and the shading of prices has practically disappeared. There is an inquiry current from a Southern railroad for 1400 tons of plates and shapes, and other roads in this territory have also been fair buyers. Track accessories, spikes and track bolts, have been moderately active in carload lots. Wire products are in better demand with prices strong. Light rails are inactive, though a sale of light rails at 2c. was made in this district last week. Bolts and nuts are strong as regards price, with orders fairly numerous.

Cincinnati jobbers quote: Iron and steel bars, 3.50c.; reinforcing bars, 3.60c.; hoops, 4.55c.; bands, 4.25c.; shapes, 3.60c.; plates, 3.60c.; cold-rolled rounds, 4.25c.; cold-rolled flats, squares and hexagons, 4.75c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, 4.80c.; No. 28 galvanized sheets, 5.85c.; No. 9 annealed wire, $3.60 per 100 lb.; common wire nails, $3.50 per keg base; cement coated nails, $3.30 per keg.

Coke.—Foundry coke is in good demand and Connellsville prices are firmer. In New River prices are unchanged at $11, but in Wise County prices are weak. By-product fuel is unchanged. Domestic sizes are exceptionally weak and for quick shipment very low prices are to be had. We quote:

Connellsville furnace, $4; foundry, $5; New River foundry, $11; Wise County furnace, $4.75; foundry, $5.50; by-product foundry, $8. Connellsville basis.

Old Material.—A sale of 10,000 tons of heavy melting steel is reported to a melter in this district at $22 delivered, but confirmation is lacking. The market, generally speaking, is soft and prices off about 50c. from last week, the whole list being affected.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel	$17.50 to $18.00
Miscellaneous rails	16.50 to 17.00
Short rails	21.00 to 21.50
Relaying rails	30.50 to 31.00
Rails for rolling	18.00 to 18.50
Old car wheels	15.50 to 16.00
No. 1 locomotive tires	17.50 to 18.00
Railroad malleable	18.50 to 19.00
Agricultural malleable	17.50 to 18.00
Loose sheet clippings	12.50 to 13.00
Champion bundled sheets	13.00 to 13.50
Per Net Ton	
Cast iron borings	12.00 to 12.50
Machine shop turnings	11.00 to 11.50
No. 1 machinery cast	21.00 to 21.50
No. 1 railroad cast	17.50 to 18.00
Iron axles	23.50 to 24.00
No. 1 railroad wrought	13.00 to 13.50
Pipes and flues	10.50 to 11.00
No. 1 busheling	12.00 to 12.50
Mixed busheling	10.00 to 10.50
Burnt cast	13.00 to 13.50
Stove plate	13.50 to 14.00
Brake shoes	14.00 to 14.50

Cleveland

Finished Material Orders Numerous, but Tonnage Not So Large

CLEVELAND, Feb. 19.—Some inquiries for finished materials have come out for second quarter contracts, and it is probable that some of the mills will open their books shortly for that delivery. Some business in alloy steel has already been booked for the second quarter. Mills are still getting a good volume of well-scattered orders. With some the orders are more numerous than last month, but the aggregate tonnage is not so large. The demand for steel bars from the automobile and accessory manufacturers continues heavy and structural material is moving well, but plates are rather slow. There is virtually no change in the delivery situation. Some of the mills are from six to eight weeks behind in deliveries on over 1-in. steel bars and spring steel, but can ship smaller steel bars in from two to three weeks and deliveries in two weeks can be secured on plates. A Cleveland mill will furnish 800 tons of fire box and boiler plates for the New York Central locomotives placed with the Lima Locomotive Works. Plates still lack strength and on desirable orders 2.40c. is quoted. In structural lines a good volume of work is coming out. During the week several contracts aggregating 3500 tons of steel were placed in this territory. The New York Central Railroad, in addition to placing 800 tons for a grade crossing bridge in Cleveland, is working on plans for considerable other bridge work. The Bucyrus Co. has taken three 50-ton and one 100-ton steam shovels for the Oliver Iron Mining Co. No inquiry is pending in the lake shipbuilding industry. Mills are not filled with hot-rolled strip steel for March rolling, and prices on this in wide material continue irregular, although some mills are not going below 2.90c. Some producers are holding to 5c. on cold-rolled strip steel and are taking orders at that price in spite of lower quotations reported in the Pittsburgh district. The demand for wire from manufacturers is good, but nails are moving slowly, as jobbers do not seem disposed to stock up. There is some price irregularity in wire specialties.

Jobbers quote steel bars, 3.36c.; plates and structural shapes, 3.46c.; No. 28 black sheets, 4.40c. to 4.65c.; No. 28 galvanized sheets, 5.60c. to 5.75c.; No. 10 blue annealed sheets, 3.60c. to 4c.; cold rolled rounds, 3.90c.; flats, squares and hexagons, 4.40c.; hoops and bands, 1 in. and wider and 20 gage or heavier, 4.16c.; narrower than 1 in. or lighter than No. 20 gage, 4.66c.; No. 9 annealed wire, $3.50 per 100 lb.; No. 9 galvanized wire, $3.95 per 100 lb.; common wire nails, $3.60 base per 100 lb.

Pig Iron.—The market has quieted down considerably in both sales and in new inquiries. Many consumers have not yet covered for the second quarter, but these seem to be in no hurry to buy. The American Radiator Co. during the week purchased 3000 tons of foundry iron for its Springfield plant, a Warren, Ohio, foundry purchased 1000 tons of foundry iron and a Mansfield consumer placed 500 tons of malleable iron. The 2700 tons of foundry iron inquired for by the Westinghouse Electric & Mfg. Co. for its Cleveland plant has not yet been placed. This inquiry brought out $24 quotations from Cleveland producers. The local market is firm at that price for Cleveland delivery, but one producer is quoting $23.50 for outside shipment and has made some sales at the latter price. Another lake furnace is holding to $24. In the Valley district foundry iron is still available at $23.50 although one middleman has advanced his price to $24, which is the more common Valley quotation. Buffalo iron continues as a factor in the Ohio market. Additional sales of Buffalo iron are reported in Cincinnati which has a $4.41 freight rate from Buffalo. Some recent sales of Buffalo iron in Ohio indicate that either the $22 price is being shaded or the silicon differential is being waived. Merchant furnaces are making an effort to get basic iron up to $23 and local producers made that quotation on the 2000 ton lot for the Alliance plant of the American Steel Foundries, but this business, which has been placed, evidently went at a lower price. Southern iron is firm at $23. Sales during the week included several hundred tons to a Pittsburgh sanitary interest at that price. We also note the sale of over 2000 tons of Southern charcoal iron in the Pittsburgh district in lots of from 300 to 1000 tons at $30 Birmingham.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6 rate from Birmingham:

Basic, Valley furnace	$22.00
Northern No. 2 fdy., sil. 1.75 to 2.25	24.50
Southern fdy., sil. 1.75 to 2.25	29.00
Malleable	24.50
Ohio silvery, 8 per cent	36.52
Standard low phos., Valley furnace	29.00 to 30.00

Semi-Finished Steel.—A Cleveland consumer has placed 1000 tons of slabs at $40, Pittsburgh. This is the only activity reported. The leading local producer has specifications covering about 30 days' full operations on its books, and is getting some second quarter inquiries, but so far has not quoted for that delivery.

Sheets.—A few inquiries have come out for second quarter contracts for which some of the mills have quoted present regular prices, but no sales are reported beyond a limited quantity of automobile body sheets. The current demand is light, but consumers are specifying freely on contracts. While most mills are comfortably fil'ed with orders, some can still take business for March shipment. While price concessions on black and galvanized sheets probably have not disappeared, the market is firmer.

Bolts, Nuts and Rivets.—The demand for bolts and nuts shows an improvement over last month and prices are firm. Specifications on contracts are good and there is a fair amount of new business at the recent price advance. Some inquiry has come out for second quarter contracts on which makers are not yet quoting. The rivet market continues dull with 2.75c. the ruling quotation except for very small lots which are bringing 2.90c.

Reinforcing Bars.—New inquiry is active. The Bourne-Fuller Co. has taken 125 tons for the Science Building, Ohio State University, Columbus. A building for the Standard Sanitary Mfg. Co., Louisville, Ky., will require 600 tons, a stadium in Erie, Pa., 300 tons, and the Bolivar Square garage, Cleveland, 200 tons. Soft steel bars appear firm at 2.30c., Pittsburgh, and rail steel bars are unchanged at 2.10c.

Coke.—The demand for spot foundry coke has improved. Prices are unchanged at from $4.75 to $6.50 for Connellsville coke, but makers are holding to $5.50 and higher for the better brands.

Old Material.—The market is inactive and weak. Not only have the mills stopped buying but several are holding up on shipments that have been coming faster than they were able to handle the material. The weakness is most pronounced in borings and turnings, which have declined $1 a ton, although grate bars and stove plate have declined to a similar extent and several other grades are lower. Heavy melting steel is holding closely to recent levels but with other grades shows the tendency to weakness. Valley dealers are paying $21 to $21.50 for heavy melting steel scrap. Unless some buying develops to support the market further reductions are looked for.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel	$19.00 to $19.50
Rails for rolling	20.00 to 20.50
Rails under 3 ft	21.00 to 21.50
Low phosphorus melting	21.50 to 21.75
Cast borings	15.00 to 15.25
Machine shop turnings	14.75 to 15.00
Mixed borings and short turnings	15.00 to 15.25
Compressed sheet steel	17.25 to 17.50
Railroad wrought	16.50 to 16.75
Railroad malleable	21.00 to 21.50
Light bundled sheet stampings	14.50 to 14.75
Steel axle turnings	16.25 to 16.50
No. 1 cast	22.00 to 22.50
No. 1 busheling	14.75 to 15.00
Drop forge flashings	14.00 to 14.25
Railroad grate bars	18.00 to 18.50
Stove plate	18.00 to 18.50
Pipes and flues	14.00 to 14.25

Philadelphia

Railroad Equipment Buying Counted on to Improve Steel Demand—Scrap Prices Break

PHILADELPHIA, Feb. 19.—Purchases of railroad equipment are expected to take up some of the slack which still exists in certain departments of the steel business, particularly plates, shapes and bars. Of the large tonnage of plates required for the 6000 cars ordered by the Norfolk & Western, at least 30,000 tons will be rolled by the Carnegie Steel Co. The Philadelphia & Reading will probably buy 1000 or 2000 more freight cars, while the New York Central is expected to order 100 passenger locomotives and the Pennsylvania may order 50. Railroad buying of track material has been substantial in the last week.

Small amounts of steel came in from European mills last week, but there has been no large movement of foreign steel to American ports, although some fair-sized orders have been placed. Uncertainty of delivery is a factor which hinders the consummation of such business, despite the fact that foreign structural shapes can be sold at about 2c. per lb., duty paid, Philadelphia, fully $13.50 per ton under the lowest reported delivered prices from domestic mills. The lots received here last week were 63 tons of structural shapes from Belgium, two tons of sheets from France, 10 tons of galvanized strip steel from England, 494 tons of blooms from France and two tons of steel tubes and seven tons of billets from Sweden.

Pig Iron.—A quiet week in pig iron has been the aftermath of two or three weeks of unusual activity. Some of the eastern Pennsylvania furnaces have so much tonnage on their books that they are indifferent regarding further business at this time. Carload lots have predominated in the past week's orders, and most of these have been sold on the basis of $23, furnace, for No. 2 plain. It is not yet certain, however, that larger tonnages could not be placed at a base price of $22.50, as there are one or two furnaces still anxious for orders. One interest is now quoting $23.50 for No. 2 plain and $24 for No. 2X. Somewhat higher prices are being quoted on foreign iron for delivery here, and for the present, at least, it appears that European iron will be less of a factor in competition with furnaces along the Atlantic seaboard. Foreign iron continues to come in on orders placed some weeks ago, one lot of 3209 tons having arrived last week from England.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76 cents to $1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$23.63 to $24.13
East. Pa. No. 2X, 2.25 to 2.75 sil.	24.13 to 24.63
East. Pa. No. 1X	24.63 to 25.13
Virginia No. 2 plain, 1.75 to 2.25 sil.	30.17 to 31.17
Virginia No. 2X, 2.25 to 2.75 sil.	30.67 to 31.67
Basic delivery eastern Pa.	22.75 to 23.50
Gray forge	22.50 to 23.00
Malleable	23.75 to 24.25
Standard low phos. (f.o.b. furnace)	27.00 to 27.50
Copper bearing low phos. (f.o.b. furnace)	27.00 to 28.00

Ferroalloys.—With very little demand, domestic and British producers of ferromanganese continue their quotations of $107.50, furnace or seaboard. Domestic spiegeleisen is held at $39, furnace, but foreign spiegeleisen has been sold at $37, duty paid, Atlantic port.

Semi-Finished Steel.—There has not been enough business in billets to test prices, which remain fairly firm at $40, Pittsburgh, for rerolling quality and $45 for forging quality.

Plates.—Further weakness in plate prices has developed, quotations for lots from a carload upward now being 2.30c. and 2.35c., Pittsburgh, while exceptional tonnages, of which there are few, have commanded even lower prices. There is keen competition for orders on the part of Eastern mills, whose orders are not keeping up at the progressive rate promised in January. Although not less than 30,000 tons of the plate tonnage for 6000 Norfolk & Western cars will be rolled by the Carnegie Steel Co., Eastern mills are hopeful that the car buying movement now apparently under way will be beneficial to the mills of this district. The New York Shipbuilding Corporation will fabricate five car floats for the New York Central Railroad, requiring about 4000 tons of plates, and the same shipyard will also build two car floats for the Delaware, Lackawanna & Western. The Central Railroad of New Jersey, the Erie and the Baltimore & Ohio are each in the market for two car floats. Plates from Eastern mills may now be quoted from 2.30c. to 2.40c., Pittsburgh.

Structural Material.—The largest structural project let in Philadelphia recently is the building for the Insurance Co. of North America, 7100 tons, which will be fabricated by the McClintic-Marshall Co. Demand for plain material keeps up at a fair rate, with quotations of 2.40c., Pittsburgh, now quite common on standard shapes. There is less disposition to shade this price, notwithstanding the fact that foreign shapes are available at about 2c., Philadelphia.

Bars.—Merchant steel bars are being sold in most instances at 2.40c., Pittsburgh, but in exceptional cases 2.35c. has been quoted. On concrete reinforcing bars the mills have frequently been obliged to go to 2.30c., Pittsburgh, to meet the competition of mills offering rerolled bars. Bar iron prices vary, some mills quoting 2.25c. and others 2.30c., Pittsburgh.

Sheets.—Customers of the American Sheet & Tin Plate Co. were today informed that it had opened its books for second quarter sheet contracts without change of prices. Sheet prices are being fairly well maintained, the original exceptions being on one pass cold rolled, which is being sold at 3.70c. and 3.75c., Pittsburgh, in some instances. The majority of orders for blue annealed are 3c., but 2.90c. is being done occasionally. A contract for 1000 tons was closed a few days ago at 3c., Pittsburgh.

Old Material.—The open winter and the good performance of the railroads in making shipments have brought scrap out in such volume within the past few weeks at the high prices which have been in effect that congestion has occurred at several mills in the Pittsburgh district and embargoes against further shipments have been declared. This situation has forced an excess of scrap into the eastern Pennsylvania territory. Nearly all of the Eastern mills in the last few weeks have covered on their requirements for 30 days or more and are now out of the market. The result is that about the only offers for scrap are from dealers who are still covering on old orders. Although there were small sales to mills early last week at $18.50 and $19, these prices probably could not be duplicated today, $18 to $18.50 being the best offerings by dealers. Almost without exception prices are down from 50c. to $2 a ton below last week's quotations.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$18.00 to $18.50
Scrap rails	18.50 to 19.00
Steel rails for rolling	21.00 to 22.00
No. 1 low phos., heavy 0.04 and under	23.00 to 24.00
Couplers and knuckles	23.00 to 24.00
Cast-iron car wheels	20.00 to 21.00
Rolled steel wheels	23.00 to 24.00
No. 1 railroad wrought	21.00 to 22.00
No. 1 yard wrought	19.00 to 20.00
No. 1 forge fire	15.50 to 16.00
Bundled sheets (for steel works)	15.50 to 16.00
Mixed borings and turnings (for blast furnace use)	15.00 to 15.50
Machine shop turnings (for steel works use)	15.50 to 16.00
Machine shop turnings (for rolling mill use)	16.00 to 16.50
Heavy axle turnings (or equivalent)	16.50 to 17.00
Cast borings (for steel works and rolling mills)	16.00 to 16.50
Cast borings (for chemical plants)	18.00 to 18.50
No. 1 cast	19.50 to 20.50
Heavy breakable cast (for steel plants)	17.50 to 18.50
Railroad grate bars	17.50 to 18.00
Stove plate (for steel plant use)	17.00 to 17.50
Railroad malleable	18.00 to 18.50
Wrought iron and soft steel pipes and tubes (new specifications)	18.00 to 18.50
Shafting	24.00 to 25.00
Steel axles	24.00 to 25.00

Prices Finished Iron and Steel f.o.b. Pittsburgh

Carload Lots

Plates

Sheared, tank quality, base, per lb.....2.40c. to 2.50c.

Structural Materials

Beams, channels, etc., base, per lb.....2.50c.
Sheet piling .....2.65c.

Iron and Steel Bars

Soft steel bars, base, per lb.....2.40c.
Soft steel bars for cold finishing.....$3 per ton over base
Reinforcing steel bars, base.....2.40c.
Refined iron bars, base, per lb.....3.10c. to 3.15c.
Double refined iron bars, base, per lb.....4.75c.
Stay bolt iron bars, base, per lb.....7.75c. to 8c.

Hot-Rolled Flats

Hoops, base, per lb.....3c.
Bands, base, per lb.....3c.
Strips, base, per lb.....3c.

Cold-Finished Steel

Bars and shafting, base, per lb.....2.90c. to 3c.
Bars, S. A. E. Series, No. 2100.....4.75c.
Bars, S. A. E. Series, No. 2300.....6.25c. to 6.50c.
Bars, S. A. E. Series, No. 3100.....5.25c. to 5.50c.
Strips, base, per lb.....4.75c. to 5.00c.

Wire Products

(To jobbers in car lots)

Nails, base, per keg.....$3.00
Galvanized nails, 1 in. and over.....$2.25 over base
Galvanized nails, less than 1 in..... 2.50 over base
Bright plain wire, base, No. 9 gage, per 100 lb.....$2.75
Annealed fence wire, base, per 100 lb..... 2.90
Spring wire, base, per 100 lb..... 3.70
Glavanized wire No. 9, base, per 100 lb..... 3.35
Galvanized barbed, base, per 100..... 3.80
Galvanized staples, base, per keg..... 3.80
Painted barbed wire, base, per 100 lb..... 3.45
Polished staples, base, per keg..... 3.45
Cement coated nails, base, per count keg.....$2.60 to 2.70
Bale ties, carloads to jobbers.....75 and 2½ per cent off list
Woven fence, carloads (to jobbers).....67½ per cent off list
Woven fence, carloads (to retailers).....65 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads,
60, 10 and 5 per cent off list
Machine bolts, all sizes, cut threads..60 and 5 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads.60 and 5 per cent off list
Carriage bolts, cut threads, all sizes.50, 10 and 5 per cent off list
Lag bolts .....65 and 5 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads...50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅝ x 4 in.,
50 and 5 per cent off list
Larger and longer sizes.....50 and 5 per cent off list
Hot pressed squares or hex. nuts, blank.....4.25c. off list
Hot pressed nuts, tapped.....4.25c. off list
C.p.c. and t. square or hex. nuts, blank.....4c. off list
C.p.c. and t. square or hex. nuts, tapped.....4c. off list
Semi-finished hex. nuts:
⅞ in. and smaller, U. S. S.....80 and 5 per cent off list
⅞ in. and larger, U. S. S.....75 and 5 per cent off list
Small sizes, S. A. E.....80, 10 and 5 per cent off list
S. A. E., ⅝ in. and larger.....75, 10 and 5 per cent off list
Stove bolts in packages.....75, 10 and 5 per cent off list
Stove bolts in bulk.....75, 10, 5 and 2½ per cent off list
Tire bolts .....60 and 10 per cent off list
Bolt ends with hot pressed nuts.....60 and 5 per cent off list
Bolt ends with cold pressed nuts.....50 and 5 per cent off list
Turnbuckles, with ends, ½ in. and smaller,
50 to 55 and 5 per cent off list
Turnbuckles, without ends, ½ in. and smaller,
65 and 5 to 70 and 10 per cent off list
Washers .....5c. to 5.25c. off list

Semi-Finished Castellated and Slotted Nuts

(To jobbers and consumers in large quantities f.o.b. Pittsburgh.)

	Per 1000 S. A. E.	Per 1000 U. S. S.		Per 1000 S. A. E.	Per 1000 U. S. S.
¼-in.	$4.80	$4.80	⅞-in.	$15.00	$15.00
5/16-in.	5.50	6.00	15/16-in.	19.50	20.00
⅜-in.	6.50	7.00	¾-in.	28.50	28.50
7/16-in.	9.00	9.50	1⅛-in.	37.00	37.50
½-in.	11.00	11.50	1-in.	58.50	60.50

Larger sizes—Prices on application.

Cap and Set Screws

Milled hex. head cap screws.....75, 10 and 5 per cent off list
Milled standard set screws, case hardened
75, 10 and 5 per cent off list
Milled headless set screws, cut thread
75, 10 and 5 per cent off list
Upset hex. head cap screws, U. S. S. thread
80, 10 and 10 per cent off list
Upset hex. head cap screws, S. A. E. thread
80, 10 and 10 per cent off list
Milled studs.....65 and 10 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb.....$2.75
Small rivets .....70 and 10 per cent off list

Track Equipment

Spikes, ⅜ in. and larger, base, per 100 lb.....$3.05 to $3.15
Spikes, ½ in., 7/16 in. and ⅝ in., per 100 lb..... 3.25 to 3.50
Spikes, 7/16 in..... 3.25 to 3.50
Spikes, boat and barge, base, per 100 lb..... 3.25 to 3.50
Track bolts, ¾ in. and larger, base, per 100 lb.. 4.00 to 4.25
Track bolts, ½ in. and ⅝ in., base, per 100 lb.. 4.50 to 5.00
Tie plates, per 100 lb..... 2.60
Angle bars, base, per 100 lb..... 2.75

Welded Pipe

Butt Weld

Inches	Steel Black	Steel Galv	Inches	Iron Black	Iron Galv.
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	2 to 3	61	50½
¼ to ⅜	47	30½	¼ to ⅜	+19	+54
½	53	42½	½	21	7
¾	58	47½	¾	28	12
1 to 1½	60	49½	1 to 1½	30	14

Lap Weld, extra strong, plain ends

2	53	42	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	7
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 per cent on black and 1½ points, with a supplementary discount of 5 per cent on galvanized.

Boiler Tubes

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1¾ to 1⅞ in.	+ 8
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Less carload lots 4 points less.

Standard Commercial Seamless Boiler Tubes
Cold Drawn

1 in.	55	3 and 3¼ in.	36
1¼ and 1½ in.	47	3½ and 3¾ in.	37
1¾ in.	31	4 in.	41
2 and 2¼ in.	22	4½ in. and 5 in.	33
2½ and 2¾ in.	32		

Hot Rolled

3 and 3¼ in.	38	4 in.	43
3½ in. and 3¾ in.	39		

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be hold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of net larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base.....83 per cent off list
Carbon 0.30 to 0.40, base.....81 per cent off list
Plus usual differentials and extras for cutting. Warehouse discounts range higher.

Seamless Locomotive and Superheater Tubes

	Cents per Ft.		Cents per Ft.
2-in. O.D. 12 gage	15	2¼-in. O.D. 10 gage	20
2-in. O.D. 11 gage	16	3-in. O.D. 7 gage	35
2-in. O.D. 10 gage	17	1½-in. O.D. 9 gage	15
2¼-in. O.D. 12 gage	17	5⅜-in. O.D. 9 gage	55
2¼-in. O.D. 11 gage	18	5½-in. O.D. 9 gage	57

Tin Plate

Standard cokes, per base box.....$5.50

Terne Plate

(Per Package, 20 x 28 in.)

8-lb. coating, 100 lb base	$11.00	20-lb. coating I. C.	$14.90
8-lb. coating I. C.	11.30	25-lb. coating I. C.	16.20
12-lb. coating I. C.	12.70	30-lb. coating I. C.	17.35
15-lb. coating I. C.	13.95	35-lb. coating I. C.	18.35
		40-lb. coating I. C.	19.35

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....3c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.85c.

Automobile Sheets

Regular auto body sheets, base (22 gage), per lb.....5.25c.

Galvanized

No. 28 (base), per lb.....5c.

Long Ternes

No. 28 gage (base), 8-lb. coating, per lb.....5.30c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.85c.

Prices of Raw Materials, Semi-Finished and Finished Products

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron	$6.45
Old range non-Bessemer, 51½ per cent iron	5.70
Mesabi Bessemer, 55 per cent iron	6.20
Mesabi non-Bessemer, 51½ per cent iron	5.55

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	11.00c.
Iron ore, Swedish, average 66 per cent iron	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus, nominal	45c.
Manganese ore, ordinary, 48 per cent manganese, from the Caucasus	42c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, per unit, in 60 per cent concentrates	$8.25 to $10.00
Chrome ore, basic, 48 per cent Cr_2O_3, crude, per ton, c.i.f. Atlantic seaboard	18.00 to 28.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	75c. to 85c.

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton	$107.50
Ferromanganese, British, 80 per cent, f.o.b. Atlantic port, duty paid	107.50
Ferrosilicon, 50 per cent, delivered	$74.00 to 75.00
Ferrosilicon, 75 per cent	140.00
Ferrotungsten, per lb. contained metal	85c. to 90c.
Ferrochromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered	10.75c.
Ferrochromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr., per lb.	10.50c.
Ferrovanadium, per lb. contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, per net ton	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent.....$38.00 to $40.00
Spiegeleisen, domestic, 16 to 19 per cent..... 37.00 to 38.00
Ferrosilicon, Bessemer, 10 per cent, $42.50; 11 per cent, $45; 12 per cent, $47.50.
Silvery iron, 5 per cent, $30.00; 6 per cent, $31.00; 7 per cent, $32.00; 8 per cent, $33.50; 9 per cent, $35.50; 10 per cent, $37.50; 11 per cent, $40.00; 12 per cent, $42.50.

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines.....$22.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines 23.50
Per 1000 f.o.b. works:

	High Duty	Moderate Duty
Fire Clay:		
Pennsylvania	$42.00 to $45.00	$37.00 to $42.00
Maryland	47.00	42.00
Ohio	42.00 to 43.00	37.00 to 39.00
Kentucky	42.00 to 43.00	37.00 to 39.00
Illinois	——	37.00 to 42.00
Missouri	42.00 to 45.00	35.00 to 40.00
Ground fire clay, per net ton		6.00 to 7.00
Silica Brick:		
Pennsylvania		$40.00 to 42.00
Chicago		49.00
Birmingham		50.00
Ground silica clay, per net ton		8.00
Magnesite Brick:		
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)		65.00
Grain mangnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)		40.00
Chrome Brick:		
Standard size, per net ton		47.00

Semi-Finished Steel, F.O.B. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over	$40.00
Rolling billets, 2-in. and under	$40.00 to 42.50
Forging billets, ordinary carbons	45.00
Sheet bars, Bessemer	42.50
Sheet bars, open-hearth	42.50
Slabs	40.00
Wire rods, common soft, base, No. 5 to ⅜-in.	51.00
Wire rods, common soft, coarser than ⅜-in.	$2.50 over base
Wire rods, screw stock	$5.00 per ton over base
Wire rods, carbon, 0.20 to 0.40	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75	7.50 per ton over base
Wire rods, carbon over 0.75	10.00 per ton over base
Wire rods, acid	15.00 per ton over base
Skelp, grooved, per lb.	2.30c. to 2.35c.
Skelp, sheared, per lb.	2.30c. to 2.35c.
Skelp, universal, per lb.	2.30c. to 2.35c.

Finished Iron and Steel, F.O.B. Mill

Rails, heavy, per gross ton	$43.00
Rails light, new steel, base, lb.	2c. to 2.15c.
Rails, light, rerolled, base, per lb.	1.85c. to 2.00c.
Spikes, ⅞-in. and larger, base, per 100 lb.	$3.00 to $3.15
Spikes, ½-in. and smaller, base, per 100 lb.	3.25 to 3.50
Spikes, boat and barge, base, per 100 lb.	3.25 to 3.50
Track bolts, ⅝-in. and smaller, base, per 100 lb.	4.00 to 4.25
Track bolts, ¾-in. and larger, base, per 100 lb.	4.50 to 5.00
Tie plates, per 100 lb.	2.60
Angle bars, per 100 lb.	2.75
Bars, common iron, base, per lb., Chicago mill	2.40c.
Bars, common iron, Pittsburgh mill	2.40c.
Bars, rails, steel reinforcing, base, per lb.	2.15c. to 2.25c.
Cold finished steel bars, base, Chicago per lb.	3c.
Ground shafting, base, per lb.	3.40c.
Cut nails, base, per keg	$3.15 to $3.25

Alloy Steel

S.A.E. Series Numbers	Bars 100 lb.
2100*(½% Nickel, 10 to 20 per cent Carbon)	$3.50
2300 (3½% Nickel)	$5.00 to 5.25
2500 (5% Nickel)	7.75 to 8.00
3100 (Nickel Chromium)	4.00 to 4.25
3200 (Nickel Chromium)	5.75 to 6.00
3300 (Nickel Chromium)	8.00 to 8.25
3400 (Nickel Chromium)	7.00 to 7.25
5100 (Chromium Steel)	3.75
5200*(Chromium Steel)	7.50 to 8.00
6100 (Chromium Vanadium bars)	4.75 to 5.00
6100 (Chromium Vanadium spring steel)	4.50 to 4.75
9250 (Silico Manganese spring steel)	3.75 to 4.00
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	5.00 to 5.25
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum)	4.50 to 4.75
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)	4.25 to 4.50
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum)	4.75 to 5.00

Above prices are for hot-rolled alloy steel bars, forging quality, per 100 lb., f.o.b. Pittsburgh. Billets 4 x 4 in. and larger are $10 per gross ton less than net ton price for bars of same analyses. On smaller than 4 x 4-in. billets the net ton bar price applies

*Not S.A.E. specifications, but numbered by manufacturers to conform to S.A.E. system.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, carload lots, 36,000 lb. minimum carload, per 100 lb.:

Philadelphia, domestic	$0.32	Buffalo	$0.265	St. Louis	$0.43	*Pacific Coast	$1.15
Philadelphia, export	0.235	Cleveland	0.215	Kansas City	0.735	*Pac. Coast, ship plates	1.20
Baltimore, domestic	0.31	Cleveland, Youngstown Comb	0.19	Kansas City (pipe)	0.705	Birmingham	0.58
Baltimore, export	0.225	Detroit	0.29	St. Paul	0.60	Memphis	0.56
New York, domestic	0.34	Cincinnati	0.29	Omaha	0.735	Jacksonville, all rail	0.70
New York, export	0.255	Indianapolis	0.31	Omaha (pipe)	0.705	Jacksonville, rail and water	0.415
Boston, domestic	0.365	Chicago	0.34	Denver	1.26	New Orleans	0.67
Boston, export	0.255			†Denver (pipe)	1.17		

*Applies minimum carload 80,000 lb. †Minimum loading 46,000 lb.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 35c.; ship plates, 40c.; ingots and muck bars, structural steel, common wire products, including cut or wire nails, spikes, and wire hoops, 40c.; sheets and tin plates, 40c.; sheets No. 12 gage and lighter, 50c.; rods, 40c.; wire rope cables and strands, 45c.; wire fencing, netting and stretcher, 40c.; pipes not over 12 in. in diameter, 55c.; over 12 in. in diameter, 2½c. per in. or fraction thereof additional. All rates per 100 lb. in carload lots, minimum 36,000 lb.

FABRICATED STEEL BUSINESS

Structural Awards During Week Total More Than 34,000 Tons, but Inquiries Are Light

Although new inquiries for structural steel buildings, as reported to THE IRON AGE, are light, less than 9000 tons, the awards for the week total more than 34,000 tons, the largest job being an office building in Philadelphia, requiring 7100 tons. More than 12,000 tons of the total was railroad work, including car shops for the Southern Railway, 4100 tons, and a bridge for the Louisville & Nashville, 6500 tons. A Detroit building takes 5500 tons.

Confirmation has been obtained of the report in the issue of Feb. 14 that the Harriman National Bank, Fifth Avenue at Forty-third Street, 4000 tons, has been awarded to Post & McCord and the American Bridge Co.

Arthur Cutler Co., loft building, West Twenty-ninth Street, New York, 700 tons, to Harris Structural Steel Co.

Apartment building, West End Avenue at Eighty-ninth Street, New York, 250 tons, to Paterson Bridge Co.

New York Central Railroad, three bridges, 300 tons, to Bethlehem Steel Co.

Southern Railway, shops at North Birmingham, Ala., 4100 tons, to Virginia Bridge & Iron Co.

Insurance Co. of North America, office building on Arch Street, Philadelphia, 7100 tons, to McClintic-Marshall Co.

Delaware, Lackawanna & Western Railroad, bridges, 1150 tons, 450 tons to American Bridge Co., 375 tons to Phoenix Bridge Co., and the remainder divided among Shoemaker Bridge Co., McClintic-Marshall Co. and Bethlehem Steel Co.

Delaware & Hudson Railroad, bridge at Fort Edward, N. Y., 300 tons, to American Bridge Co.

Garage, Albany, N. Y., 1200 tons, to Levering & Garrigues Co.

Buhl Building, Detroit, 5500 tons, divided between Russell Wheel & Foundry Co. and Bass Construction Co.

University of Illinois, Urbana, building, 1500 tons, to Duffin Iron Works.

Chicago Riding Club, building, Chicago, 1000 tons, to Morava Construction Co.

Crocker Estate, four-story building, San Francisco, 275 tons, to California Steel Co.

Louisville Gas & Electric Co., Louisville, self supporting steel stake, 100 tons, to Louisville Bridge Co.

Schenck China Co., Pittsburgh, warehouse, 300 tons to Jones & Laughlin Steel Corporation.

The Hoover Suction Sweeper Co., North Canton, Ohio, factory buildings, 700 tons, to Canton Bridge Co.

Louisville & Nashville Railroad, 9-span bridge over Rigolets Bay, Louisiana, 6500 tons, to American Bridge Co.

Detroit Edison Co., Detroit, transmission towers, 400 tons to American Bridge Co.

Louisville & Nashville Railroad, warehouse at New Orleans, 1400 tons, to Lukens Steel Co.

Security Trust Co., Detroit, bank building, 450 tons, to Fort Pitt Bridge Works.

Buckeye Steel Castings Co., Columbus, foundry, 1200 tons, to Mount Vernon Bridge Co.

New York Central Railroad, 152nd Street bridge, Cleveland, 800 tons, to Mount Vernon Bridge Co.

Cattle building, State of Ohio, Columbus, 380 tons, to International Derrick & Equipment Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Loft building, 215 West Fortieth Street, New York, Shroeder & Koppel, general contractors, 750 tons.

Garage, 5155 Lexington Avenue, New York, 450 tons.

L. Bamberger & Co., Newark, N. J., warehouse, 1000 tons.

Museum, Newark, N. J., 300 tons.

New England Fuel Co., Boston, coal handling plant, 1000 tons.

Michigan Central Railroad, grade separation, Spring Wells, Mich., 650 tons.

Chicago, Burlington & Quincy, girder and I-beam spans, 765 tons.

Pennsylvania Railroad, Fifty-fifth Street Subway, Chicago, 915 tons.

Two ten-story hotel buildings, 900 tons, Louis Kamper, Detroit, architect.

Erie County, Buffalo, N. Y., bridge work, 400 tons, bids taken.

Union Bank & Trust Co. and Coal Exchange buildings, Huntington, W. Va., 2000 tons.

Lewis Burke Co., Philadelphia, meat packing building, 500 tons.

RAILROAD EQUIPMENT BUYING

Orders Placed for 6220 Cars and Considerably More Equipment May Be Bought This Week

Not counting 18,000 cars for the New York Central and 10,000 or more car bodies for the Pennsylvania, which may be ordered this week, there are new inquiries pending for 13,525 cars. In addition several thousand cars are being talked of as probable purchases soon, although definite inquiries are not out. Orders for 6220 cars were announced during the week, this including 2000 for the Norfolk & Western in addition to the 4000 reported a week ago. A good deal of car buying seems to be in prospect, some of it still being in a rather indefinite stage.

Unfilled orders for locomotives at the end of January numbered 376, including 32 for foreign roads, against 387 at the end of December, including 22 for export, according to reports received by the Department of Commerce.

The Union Pacific Railroad is inquiring for 25 locomotives.

The New York Central is reported to be considering the purchase at an early date of 100 passenger locomotives.

The Pennsylvania Railroad is expected to place an order shortly for 50 locomotives.

The Philadelphia & Reading will probably buy 1000 or 2000 freight cars in addition to those recently ordered.

The Pennsylvania has issued inquiries for 8000 box and 1000 stock cars, requiring 80,000 tons of steel exclusive of the axles.

The Santa Fe has placed 1000 box and 500 automobile cars with the Pullman Co., in addition to the 2000 refrigerator cars which it bought a week ago.

The Cincinnati & Northern has ordered 500 box cars from the American Car & Foundry Co.

John Morrell & Co., packers, Ottumwa, Iowa, have ordered 100 refrigerator cars from the American Car & Foundry Co.

The Chicago, Milwaukee & St. Paul expects to enter the market in March, if financing can be arranged, but its program will not exceed 3000 cars.

The Central of Georgia contemplates inquiring for repairs to 100 box cars.

The Soo Line is inquiring for 25 milk cars.

The Pacific Electric is in the market for 62 street cars.

The Interborough Rapid Transit, New York, is inquiring for 148 steel underframes for coaches.

The Atlantic Tar & Chemical Co., Elizabeth, N. J., has placed 20 10,000-gal. tank cars with the American Car & Foundry Co.

The El Paso & Southwestern has purchased 400 50-ton box cars from the Standard Steel Car Co.

The New York, Chicago & St. Louis (Nickel Plate) is inquiring for 10 Mikado type and 10 8-wheel switching type locomotives.

The Norfolk & Western Railroad has ordered 2000 70-ton all-steel hopper cars in addition to the 4000 reported in THE IRON AGE of Feb. 14, a total of 6000, which were divided among the following car builders: Ralston Steel Car Co., 2000; Pressed Steel Car Co., 1000; Virginia Bridge & Iron Co., 1000; Standard Steel Car Co., 1000; Bethlehem Steel Co., 1000. These cars will require about 100,000 tons of steel inclusive of axles.

The New York Central and the Pennsylvania will probably place orders for cars and car bodies this week. The New York Central has been reported as inquiring for 18,000 freight cars, while the Pennsylvania is in the market for 10,000 or more freight car bodies.

The New York Central has placed orders for 173 passenger cars as follows: 50 coaches each to the Standard Steel Car Co., American Car & Foundry Co. and the Pullman Co. and 23 combination cars to the Pressed Steel Car Co.

The Northern Pacific Railroad has placed an order for 200 ore cars with the Pressed Steel Car Co.

The Union Railroad, a subsidiary of the United States Steel Corporation, is in the market for 1000 55-ton steel hopper cars.

The Atchison, Topeka & Santa Fe has ordered 500 composite gondolas from the American Car & Foundry Co.

The Missouri Pacific Railroad is inquiring for 1000 composite automobile box cars.

The Southern Railway has issued an inquiry for prices on 1250 composite gondolas and 750 composite hopper cars.

The Denver & Rio Grande Western is inquiring for 500 40-ton automobile box cars.

The Fruit Growers Express has ordered 500 steel underframes for refrigerator cars from the Western Steel Car & Foundry Co. and will build 1000 refrigerator cars in its own shops.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
Feb.	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
13.....	13.00	12.50	54.00	9.00	8.90	7.07½	6.72½
14.....	13.25	12.62½	54.55	9.00	8.90	7.12½	6.77½
15.....	13.37½	12.87½	54.87½	9.00	8.90	7.22½	6.87½
16.....	13.50	13.12½	....	9.00	8.90	7.25	6.90
18.....	13.62½	13.12½	55.00	9.00	8.90	7.27½	6.92½
19.....	13.62½	13.25	53.50	9.00	8.90	7.27½	6.92½

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, Feb. 19.

Pronounced strength and considerable activity characterizes all the markets. Copper has risen sharply and tin is still firm and high. Lead continues scarce with higher prices. Zinc has risen sharply.

Copper.—On the strength of considerable domestic, as well as export, buying in the past week, the electrolytic copper market has advanced sharply, particularly in the last two days. Prices are nearly ¾c. per lb. higher than a week ago and there are predictions that the metal will go to 14c. From Saturday to Monday there was a jump of ¼c. per lb. with the result that the pace slackened somewhat yesterday, although several producers were asking a minimum of 13.50c., delivered. Copper could, however, be bought for 13.37½c. from some producers yesterday. Sales are reported as having been larger than on any day recently, with inquiries running into large figures. Today the price is at a minimum of 13.50c., delivered. Accompanying the advance in refined copper there have been sharp advances in the prices of finished products. Lake copper is quoted largely nominal at 13.62½c., delivered.

Tin.—The past week in the Straits tin market has been much quieter than the preceding one when the market bordered on wild excitement. The prominent operator from England is still here and predicting high prices. Total sales during the week have approximated 1500 to 2000 tons with Friday, Feb. 15, the most interesting and active day. Prices varied widely on that day, spot Straits at noon selling at 54.37½c. and later in the day as high as 55.50c. Yesterday 200 tons changed hands, spot prices varying from 55.25c. down to 54.75c., with the range for futures from 55c., down to 54.25c. The market today has been moderately active and a fair business was done, mostly among dealers, with spot Straits closing at 53.50c. Again today the price range has been variable with the March position selling at 53.75c. and February-March shipment from the East at 53c. The lower price today compared with the spot Straits price of 55c. yesterday is due partly to a weakening of the speculative position. The London market experienced today the first weakness in some weeks, spot standard being quoted at £280, future standard at £276 15s. and spot Straits at £280 5s., all nearly £14 per ton higher than a week ago. Arrivals thus far this week have been 5940 tons, with 7575 tons afloat.

Lead.—Conditions in this market continue chaotic so far as an estimation of market prices is concerned. Prompt lead is stated as selling at New York at about 9.50c. and at St. Louis at anywhere from 9.25c. to 9.50c. Its scarcity continues a feature. The leading interest again raised its contract price to 8.40c. on Feb. 14 and to 8.50c., New York, on Feb. 15. Spot prices in the outside market are largely nominal. It is stated that producers are showing a disposition to restrain the advance in prices as much as possible but thus far their efforts have not been very successful.

Zinc.—The market for prime Western zinc is firm. Prices in the last week have advanced about 20 points on fairly good domestic demand as well as considerable demand by dealers and operators. General offerings are not free, particularly because the market has nearly approached the 7c. level. In general, consuming buying has been fairly large by both galvanizers and brass mills whose business for the first half of this year has a more prosperous outlook.

Nickel.—Quotations for shot and ingot nickel are unchanged at 29c. to 32c. per lb., with electrolytic nickel held at 32c. by leading producers. In the outside market both shot and ingot are quoted at 29c. to 32c. per lb.

Antimony.—Offerings of resale lots have appeared and the market is not quite so tight as recently. Wholesale lots for early delivery are quoted at 11c., New York, duty paid and rods afloat are offered at 9c. in bond.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 27.50c. to 28c. per lb., duty paid, delivered by importers able to obtain the metal from foreign producers. Quotations by the leading American producer are not yet public.

Old Metals.—The market is firmer and business active. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	12.50
Copper, heavy and wire	11.50
Copper, light and bottoms	10.25
Heavy machine composition	10.50
Brass, heavy	8.00
Brass, light	6.25
No. 1 red brass or composition turnings	9.25
No. 1 yellow rod brass turnings	7.25
Lead, heavy	8.00
Lead, tea	6.75
Zinc	5.00
Cast aluminum	18.50
Sheet aluminum	18.50

Chicago

FEB. 19.—All of the metals have advanced on a general buying movement. Inquiry for copper is heavy and both export and domestic business has been placed. There is almost a famine in lead supplies and outside prices are fully 1c. above that of the leading producer. Forward buying of lead, however, is rather restricted, owing to the general belief that the present market situation is artificial. Demand for zinc has improved somewhat, but prices have gone up largely out of sympathy for the other metals. Antimony is stronger because of internal strife in China which is limiting production and exports from that country. Demand for old metals is also active with most grades higher than a week ago. We quote in carload lots: Lake copper, 13.75c.; tin, 56.50c.; lead, 9.55c.; spelter, 6.95c.; antimony, 12.50c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 9.50c.; red brass, 9c.; yellow brass, 7.25c.; lead pipe, 7.25c.; zinc, 4.25c.; pewter, No. 1, 29c.; tin foil, 35c.; block tin, 42c.; all buying prices for less than carload lots.

Detroit Scrap Market

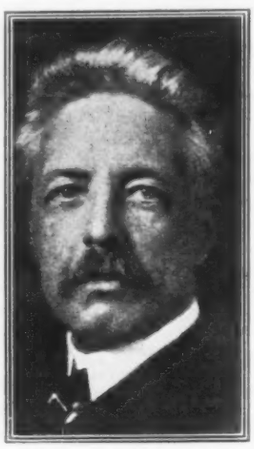
DETROIT, Feb. 19.—The market on old material has shown a decided softening tendency in the past few days. Dealers are now showing much interest in lists being offered by producers. This interest reflects the melters' attitude toward recent high scrap prices as compared with pig iron.

The following prices are quoted on a gross ton basis f.o.b. cars producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting steel	$16.75 to $17.25
Shoveling steel	16.75 to 17.25
Borings	12.50 to 13.00
Short turnings	12.50 to 13.00
Long turnings	11.25 to 11.75
No. 1 machinery cast	16.50 to 17.00
Automobile cast	24.00 to 25.00
Hydraulic compressed	14.50 to 15.50
Stove plate	14.00 to 15.00
No. 1 busheling	12.50 to 13.00
Sheet clippings	11.00 to 11.50
Flashings	11.50 to 12.00

PERSONAL

Albert Sauveur, professor of metallurgy and metallography at Harvard University, has been awarded the Bessemer Gold Medal for 1924 by the Iron and Steel Institute of Great Britain, "in recognition of eminent services in the advancement of the science of the metallurgy of iron and steel." The medal will be presented to Dr. Sauveur at the May meeting of the institute in London. This is the sixth time that the Bessemer medal, founded in 1874, has been awarded to an American metallurgist, the last award having been made to Henry Marion Howe 29 years ago. The other American recipients have been Peter Cooper (1879), Alexander Lyman Holley (1882), Abram S. Hewitt (1890), and John Fritz (1893).



ALBERT SAUVEUR

Dr. H. W. Gillett has been appointed, effective March 1, chief of the division of metallurgy of the United States Bureau of Standards, which has been vacant since Dr. George K. Burgess was made director of the bureau. Dr. Gillett was graduated from Cornell University in 1906, receiving his degree of doctor of philosophy later. He installed the research department of the Aluminum Castings Co., Cleveland, and for the past 11 years has been in charge of the Ithaca field office, Ithaca, N. Y., of the Bureau of Mines, devoting much of his time to electric brass furnaces and ferrous and non-ferrous alloys. His work in connection with the development of a well-known type of electric brass melting furnace and his contributions to both non-ferrous and ferrous metallurgy are some of the products of his career in recent years.

Walker W. Lewis, formerly superintendent of the open-hearth department of the Ashland Works, American Rolling Mill Co., has gone to England to engage in special work for the company. He will be abroad for at least eight months. K. A. McCutcheon, formerly assistant superintendent, will succeed Mr. Lewis.

E. L. Essley, president and treasurer E. L. Essley Machinery Co., Chicago, is spending the winter in Florida and expects to remain there until April 1. He is spending most of his time at Miami, but also visited Cuba.

C. W. Eger, managing director of Elektrokemisk Industri, Norway, and connected with numerous Norwegian hydro-power developments and electrochemical industries, is now in the United States with his metallurgical advisor, Dr. M. Sem, to negotiate for the use of the Soderberg continuous self-baking electrode.

Clinton S. Smith, Fairfield, Conn., employment manager at the Ashcroft works of Manning, Maxwell & Moore, Bridgeport, Conn., has resigned his position to take charge of the personnel department of the Westinghouse Electric Products Co., Mansfield, Ohio.

Martin L. Dunn, who for the past 18 months has been connected with Louis J. Klauder, consulting engineer, Philadelphia, as resident engineer on properties at Williamsport, Pa., owned by the Electric Bond & Share Co., has severed that connection and is now employed in the reports department of Day & Zimmerman, Inc., Philadelphia.

Charles P. Perin, of Perin & Marshall, consulting engineers, New York, is scheduled to deliver an address at Princeton University, Feb. 21, under the auspices of the Cyrus Fogg Brackett lectureship in applied engineering technology. The title of his address is "Iron and Steel—Civilization's Dependence Upon Them and Obligation to Them."

Charles T. Moke, since 1910 assistant purchasing agent of the Youngstown Sheet & Tube Co., Youngstown, Ohio, has been appointed purchasing agent to fill the vacancy caused by the death of A. D. Murray.

Robert T. Harris, who has been located at the New York office of the Blaw-Knox Co., Pittsburgh, has been transferred to Baltimore as district sales manager; Walter H. Duncan, formerly field engineer for the John F. Casey Co., contractor, has joined the sales staff of the road equipment department of Blaw-Knox Co.; William F. Glasser, formerly engineer in the heavy forms department of the Blaw-Knox Co., has been promoted to assistant chief engineer of the department; Charles K. Wehn, formerly located at the company's Chicago office, has been transferred to the Pittsburgh office, as district manager of the standard steel building department at Pittsburgh, and R. D. Spradling, who has been located at the company's Baltimore office, has been made district manager of the standard building department at Chicago.

C. M. Porcher, who as briefly announced in THE IRON AGE of Feb. 14, had resigned as manager of the New York office of the Pittsburgh Steel Co., was indirectly and directly associated with the company for a period of 22 years. He was a member of the firm of Pierson & Co., iron and steel merchants, New York, from 1902 to 1909, when that firm represented the Pittsburgh Steel Co. in the Eastern district. In 1909 the Pittsburgh Steel Co. opened its own offices in New York and Mr. Porcher then withdrew from Pierson & Co. to become manager in charge of sales in the Eastern district. M. E. Johnson, assistant general manager of sales of the Pittsburgh Steel Co. in charge of the export department, who has been placed in charge of the New York office with jurisdiction over both the domestic and export business of that office, became associated with the company in 1902. His first position was assistant manager of the wire fence department. In 1909 he was made assistant general manager of sales and since 1915 has had charge of the export department in New York.

C. M. PORCHER

M. E. JOHNSON

C. S. Huntington, sales engineer in charge of the sand and gravel washing division of the Link-Belt Co., Chicago, has been appointed to look after the company's interests in the cement industry, in addition to his regular duties. Howard MacNeal, formerly at the Philadelphia plant of the Link-Belt Co., has been transferred to the Chicago works.

J. H. Chaplin, vice-president and director of sales of the Root Co., Bristol, Conn., manufacturer of automatic recording instruments, has sailed for England, to look after the details of various installations of

automatic counters in textile mills there. While in England he will make a close study of the particular methods in use.

George Scherr, American representative of Schuchardt & Schutte of Berlin, will sail Feb. 23, for a six-week trip to Europe.

George P. Bowman, author of the article in THE IRON AGE of Nov. 29, entitled "Help Wanted by Technical College Men," and lately manager of one of the departments of the National Employment Exchange, has established himself in business at 141 Broadway, New York, as a specialist in personnel management, partly to assist organizations to obtain men to handle that class of work.

F. M. White, manager of sales in the Chicago district for the Corrugated Bar Co., has been appointed to the same position for the Kalman Steel Co., which recently purchased the Corrugated company. He will continue to have headquarters at Chicago. Mr. White was graduated from Cornell University, class of 1911, and after graduation was identified with the State Engineer's Department of New York until 1914, when he joined the engineering department of the Corrugated Bar Co. at Buffalo. In 1916 he was appointed district engineer with headquarters at Atlanta, Ga., and in February, 1918, was granted leave of absence for military service as a first lieutenant in the construction division of the army. In March, 1919, he was mustered out and on April 1, 1919, went to Chicago as district engineer for the Corrugated company. In January, 1923, he was promoted to district manager of sales at that city.

John W. F. Bennett, recently chief construction engineer of the American Sugar Refining Co., has become associated with Stevens & Wood, Inc., 120 Broadway, New York, in engineering, construction and management work, as vice-president and contract manager.

Judge Elbert H. Gary, chairman United States Steel Corporation, arrived Tuesday at Callao, Peru, motored to Lima and spent Wednesday in that city, expecting to continue his trip southward Thursday.

H. H. Davis has resigned as assistant general sales manager of the Pittsburgh Crucible Steel Co., Pittsburgh, to accept a like position with the Molybdenum Co. of America, general offices of which are located in the Empire Building, Pittsburgh.

Walter W. Noble, formerly attached to the general sales office, Pittsburgh Crucible Steel Co., Pittsburgh, has been appointed Eastern district sales manager of the company, with headquarters in New York. Before joining the Crucible company, about a year ago, he was secretary and general manager of sales for the Carbon Steel Co., Pittsburgh.

Louis A. McAbee has been appointed district representative of the Eastern Fuel Co., Pittsburgh, with headquarters at Hagerstown, Md. He was stationed at various points in the United States in charge of traffic for the aviation service during the World War, after which and until recently he was division freight agent of the Western Maryland Railroad, with headquarters at Hagerstown.

The annual meeting of the Iron and Steel Institute will take place on Thursday and Friday, May 8 and 9, at the House of the Institution of Civil Engineers, Great George Street, London, S.W. 1. The annual dinner will be held on the evening of Thursday, May 8, at the Hotel Cecil, Strand, W.C. Particulars of the cost of the dinner, and details of the arrangements, will be circulated later.

The Federal Trade Commission has set March 3, as the date for a hearing to be held in Phoenix, Ariz., on its complaint against the Pacific Coast Steel Companies and the Steel Mill & Foundry Supply Co., which are charged with the creation of a monopoly in the purchase of scrap iron and steel. The hearing will be held before Examiner W. F. Dinnen.

OBITUARY

Richard F. Johnston

Richard F. Johnston, for many years correspondent of THE IRON AGE at Birmingham, Ala., whose death on Feb. 10 was briefly noted in our last issue, was born in Sparta, Ga., March 17, 1861, and spent his youth in that city. He was graduated from the University of Maryland, studied law and was admitted to the bar, but after teaching for a time became a member of the staff of the Birmingham News in 1886, remaining with that paper for many years. He then became associate editor and managing editor of the Birmingham Ledger, which was absorbed by the News. In his later years, Mr. Johnston was employed as associate editor and commercial and industrial writer for the Birmingham Age-Herald. He is survived by his wife and two sons.

R. F. JOHNSTON

The funeral from the Independent Presbyterian Church, Feb. 12, was attended by executives of all of the leading iron and steel companies of Birmingham, by whom he was held in the highest esteem. Although handicapped for many years by physical disabilities, Mr. Johnston was able until a few months ago to carry on his arduous duties and he was an optimist to the end.

HARRY M. CLARK, formerly auditor of the McKeesport Tin Plate Co., McKeesport, Pa., died at his home in Otto, Pa., Feb. 11. He was born in Wheeling, W. Va., 65 years ago and had been identified with the McKeesport company from its organization in 1901.

SIEGFRIED HELLER, founder of the S. Heller Elevator Co., Milwaukee, manufacturer of hydraulic and electric freight and passenger elevators, died on Feb. 9.

BARAK L. KNOWLES, aged 45 years, for many years publicity manager for the Worthington Pump & Machinery Corporation, 115 Broadway, New York, suffered a fatal stroke of apoplexy, Feb. 14. He was active in the Technical Publicity Association. Mr. Knowles started his career 28 years ago as an office boy with the Worthington company.

JOSEPH STRUTHERS, supervising engineer of tests for the Army Ordnance Department from 1918 to 1920, died of heart trouble at the French Hospital in New York, Feb. 18. He was born in New York 58 years ago, and in 1895 was graduated from Columbia University, for which he organized and instructed the first summer school in practical metallurgy at Butte, Mont.

EDWIN LUDLOW, formerly president of the American Institute of Mining and Metallurgical Engineers, died at Muskogee, Okla., on Feb. 10, aged 65 years. He was born at Oakdale, L. I., and was graduated from the Columbia University School of Mines in 1879. After 30 years' work in supervising various coal properties, he went into business as consulting mining engineer in New York.

ABRAHAM LURIA, aged 47, a director of Luria Brothers & Co., dealers in iron and steel scrap, Reading, Pa., died Feb. 18 at Atlantic City, N. J., where he had been convalescing from an illness of about six weeks. He was a resident of Reading, Pa., for many years, and was in charge of the scrap yard of the company in that city, being known among consumers through the Cumberland Valley. Two brothers, A. L. Luria and Max Luria, are officers of the company.

Machinery Markets and News of the Works

BUSINESS DISAPPOINTING

Machine-Tool Builders Not Getting as Many Orders as Had Been Expected

Inquiries Are More Numerous Than Buyers, but Prospects Appear Somewhat More Encouraging

Machine-tool trade has not shown any appreciable gain in volume as compared with last month, and builders of tools express disappointment, as the number of inquiries received since the first of the year has given promise that has not been realized.

A number of large buying projects are in the development stage. The Southern Railway will inquire within a few days for a large amount of new equipment for its shops to be built at North Birmingham, Ala. The Standard Sanitary Mfg. Co. is expected to buy about $1,000,000 worth of equipment of various types for a plant at Louisville, Ky., and also a considerable amount for a Baltimore plant.

The automobile industry continues as a substantial buyer, the Dodge Brothers Motor Car Co. taking considerable tool equipment last week. There is a little more interest among builders of machinery such as paper mill equipment, laundry machines, etc., and a number of good orders have come from these fields.

Railroad buying is not important, but a few projects are pending. The Big Four is expected to buy a list of tools this week. The Chesapeake & Ohio is in the market for a number of engine lathes. The Santa Fe has added a few tools to its lists, making a total of 106 items now pending.

Used machinery is being placed on the market in volume. The Winton Co., Cleveland, will dispose of more than 200 tools which have been used in automobile manufacturing, which the company will discontinue. The Moline Plow Co. has sold about 200 used machines to another farm implement manufacturer.

New York

NEW YORK, Feb. 19.

THE machine-tool trade expresses disappointment in the lack of encouraging signs. Inquiries received during January seemed to indicate a fairly substantial revival of buying, but the situation this month shows little change and the volume of business is not generally considered satisfactory. Companies engaged in making automobile parts and accessories are among the busiest of any in metal-working lines, but orders have been coming in a small way from machinery companies, particularly those making paper machinery and laundry machinery.

The Cameron Can Machinery Co., Chicago, placed an order for a 62-in. boring and turning mill with an Eastern company. The Southern Pacific Railroad has bought a car box borer. Other railroad business is not developing rapidly, but it is expected that the list of the Southern Railway for equipping its new shops at North Birmingham, will be issued from the purchasing offices in Washington within a few days.

The North Kensington Refinery, 214 East Twenty-second Street, New York, has plans for extensions and improvements in its four-story sugar refinery, to cost $100,000 including additional equipment. Morgan M. O'Brien, 49 East Ninetieth Street, is architect. Louis M. Haltog is president.

Marsicano, Papetti & Co., Sao Paulo, Brazil, importers, are making inquiries for wire-drawing machinery; machines for tinning and wrapping wires and cables and machines for handling magnet wire, with view to purchase and representation.

Oscar Goldschlag, 1482 Broadway, New York, architect, has plans under way for a four-story automobile service and repair building, 100 x 225 ft., on 155th Street, for a company now being organized, estimated to cost $200,000, with equipment.

The International Business Machines Corporation, New York, has been organized under State laws to take over and expand the Computing, Tabulating & Recording Co., 50 Broad Street. The change of name has been made primarily for the development of additional lines of equipment and devices. The names of the subsidiaries will remain as heretofore, these being the Tabulating Machine Co., with plants at Washington, D. C., and Endicott, N. Y.; International Time Recording Co., Endicott, and the Dayton Scale Co., Dayton, Ohio.

The Hardware Stamping Co., 182 Avenue C, New York, has inquiries out for a squaring shear, about 36 in. or larger.

Creditors of the Standard Tank Car Co., 342 Madison Avenue, New York, have taken over the plant at Sharon, Pa. A reorganization of the company will be arranged at once and operations resumed. John Stevenson, Jr. was president and principal stockholder of the former company. J. Bruce Carr, Pittsburgh, will head the new company.

The Wilson Mfg. Co., 137 Grand Street, New York, manufacturer of tools, etc., has inquiries out for a press, Bliss or V. & O. type.

The Standard Oil Co. of New York, 26 Broadway, has awarded a general contract to the H. D. Best Co., 949 Broadway, for a one-story laboratory, 60 x 122 ft., at its plant at 394-404 Greenpoint Avenue, estimated to cost $55,000 with equipment. Work will commence in March.

The Eastern New Jersey Power Co., Asbury Park, N. J., recently organized, has secured permission to take over the Atlantic Coast Electric Light Co., Atlantic Coast Electric Railway Co., and the New Jersey Water & Light Co., and consolidate and expand the properties. A bond issue of $3,250,000 has been authorized, the proceeds to be used for the acquisitions and extensions.

The Engineering and Construction Division, Bureau of Highways, Borough of Queens, City of New York, Long Island City, has completed plans for two automobile service and repair buildings for department motor trucks and cars, to cost $140,000 with equipment. One building will be one-story, 105 x 205 ft., at Eighty-second Road and Ninety-fourth Street, Newtown, L. I.; the other, one-story, 60 x 180 ft., at Sixty-third and Thursby Streets, Jamaica, L. I. Work will commence at once.

The National Administrative Council, Montevideo, Uruguay, will soon have plans prepared for the construction of a hydroelectric generating plant on the Rio Negro River.

The Crane Market

There is a good volume of inquiry for electric overhead cranes and a fair volume of business has been closed in the past week. Both new inquiry and current sales of locomotive cranes are light. The inquiry of the Lehigh Valley Railroad, 143 Liberty Street, New York, for a 25-ton overhead crane for Wilkes-Barre, Pa., has been revised to a 30-ton, 37-ft. span, overhead crane with 5-ton auxiliary. Among pending inquiries for overhead cranes are those of the General Electric Co., Schenectady, N. Y.; Anaconda Copper Mining Co., New York; Interborough Rapid Transit Co., New York; Stone & Webster, Boston, Mass.; Western Electric Co., New York. The purchasing department, City of New York, has not yet awarded the twenty-five 1½-ton hand power hoists, bids on which were recently opened. Bids are now being received by this department on two 2-ton and a 1-ton power hoist. The low bidder on the revolving crane whirler, recently asked for by the United States Engineers' Office, Milwaukee, was the McMyler-Interstate Co., with a price of $19,200. In the Pittsburgh district the American Sheet & Tin Plate Co. has secured bids on four cranes for its Guernsey works, Cambridge, Ohio, and award of the business is expected in a few days. The seven cranes for the Standard Sanitary Mfg. Co. for its new Baltimore plant are expected to be placed soon.

Among recent purchases are:

New York, New Haven & Hartford Railroad, New Haven, Conn., a 10-ton, 42-ft. span gantry crane for Cedar Hill freight yard from the Whiting Corporation.

Eagle Bronze Co., Mount Vernon, N. Y., a 5-ton hand power crane from the Whiting Corporation.

National Plate Glass Co., Ottawa, Ill., a 2-ton, 49-ft. span, 3-motor and a 15-ton, 23-ft. span, 3-motor, overhead traveling cranes in addition to the list of cranes reported last week, bringing the total number of cranes to 14 purchased from the Whiting Corporation.

United States Engineers' Office, Florence, Ala., one 150-ton, 65-ft. span, 4-motor overhead traveling crane with 10-ton auxiliary, for the Wilson Dam, awarded to Niles-Bement-Pond Co., low bidder. Only one of the two 150-ton cranes on which bids were submitted was purchased.

Phoenix Utility Co., 71 Broadway, New York, three 10-ton and one 4-ton hand power hoists for export to Cuba, from the Wright Mfg. Co.

Otis Elevator Co., San Francisco, Cal., a 2-ton single I beam crane from the Shepard Electric Crane & Hoist Co.

Crescent Creamery, Los Angeles, Cal., a 2-ton, 34-ft. span single I beam crane from the Shepard Electric Crane & Hoist Co.

United States Cast Iron Pipe & Foundry Co., Burlington, N. J., a 5-ton, 35-ft. span electric crane from the Pawling & Harnischfeger Co.

Easton Axle & Spring Co., Cleveland, a 10-ton, 3-motor electric traveling crane from the Cleveland Crane & Engineering Co.

Cleveland Steel Co., Cleveland, two 5-ton trolleys from the Cleveland Crane & Engineering Co.

Sharpsville Furnace Co., Sharpsville, Pa., a 10-ton, 60-ft. span, slag pit crane from the Cleveland Crane & Engineering Co.

Vulcan Mould & Iron Corporation, Latrobe, Pa., a 10-ton trolley from the Shaw Electric Crane Co.

Ellwood City Forge Co., Ellwood, Pa., a 5-ton, 33-ft. span crane from the Detroit Hoist & Machine Co., through Manning, Maxwell & Moore.

Union Drawn Steel Co., Beaver Falls, Pa., a 3-ton, 19-ft. 6-in. span crane from the Detroit Hoist & Machine Co., through Manning, Maxwell & Moore.

McClintic-Marshall Co., Pittsburgh, two 6-ton, 23-ft. span assembling cranes for its Rankin, Pa., works, from the Shaw Electric Crane Co.

Southern Railway, two 80-ton, 70-ft. span overhead cranes with 20-ton auxiliaries, one for Knoxville, Tenn., the other for Spencer, N. C., from the Shaw Electric Crane Co.

Ford Motor Co., Detroit, two 5-ton, 60-ft. span cranes from the Shaw Electric Crane Co.

Elliot Frog & Switch Co., East St. Louis, a 5-ton, 38-ft. span crane from the Shaw Electric Crane Co.

Dreis & Krump, Chicago, a 10-ton electric traveling crane from the Whiting Corporation.

Kentucky Hydro-Electric Co., Chicago, a 45-ton electric traveling crane from the Whiting Corporation.

Chicago & Western Indiana Railroad, a 5-ton hand power pillar crane from the Whiting Corporation.

Bliss & Laughlin, Inc., Harvey, Ill., a 5-ton electric traveling crane from the Whiting Corporation.

Atchison, Topeka & Santa Fe Railroad, three 1-ton, eleven 1½-ton, two 3-ton and a 10-ton hand power jib cranes with 28 trolleys of various capacities for the San Bernardino, Cal., shops from the Chisholm-Moore Mfg. Co.

American Steel & Wire Co., Waukegan, Ill., thirty-five ¼-ton underhung hand power monorail hoists from the Chisholm-Moore Mfg. Co.

South Dakota State Cement Commission, Rapid City, S. D., two 6-ton, 35-ft. span, one 4-ton, 15-ft. span, one 6-ton, 24-ft. span, one 5-ton, 18-ft. span, one 3-ton, 20-ft. span, underhung hand power cranes from the Chisholm-Moore Mfg. Co.

Dirienzo Bros., Madison, Wis., a 5-ton, 17-ft. span double I beam hand power crane from the Chisholm-Moore Mfg. Co.

Stotzer Granite Co., Milwaukee, one 4-ton, 37-ft. span and one 3-ton, 28-ft. span, double I beam hand power cranes from the Chisholm-Moore Mfg. Co.

---

estimated to cost $11,500,000. It is proposed to purchase the electric equipment in the United States.

The Empire Carting Co., 21 Park Row, New York, has acquired 11 lots at Seventy-third and Exterior Streets, as a site for an automobile service and repair building for company motor trucks and cars, to cost $70,000 with equipment.

The Simmons Machine Co., Albany, N. Y., has acquired the plant and property of the United States High Speed Steel Corporation, Green Island, N. Y., bankrupt. The new owner will make improvements and plans for the early resumption of operations as an auxiliary of the Albany works. Charles A. Simmons is head.

Manual training equipment will be installed in the two-story and basement high school to be erected at Fort Edward, N. Y., estimated to cost $150,000, for which bids will be asked on a general contract before the end of the month. Loth & White, 109 State Street, Albany, N. Y., are architects.

Officials of the International Combustion Engineering Corporation, 43 Broad Street, New York, have organized the Carbo Union Co., to manufacture and distribute heavy combustion machinery in Germany. Carl Schwarts of the parent organization, will leave for Germany to arrange for operations. Hugo Stinnes, Germany, is interested in the new company.

The Edis Garage, Inc., New York, care of Louis A. Sheinart, 192 Broadway, architect, has purchased property, 74 x 108 ft., on Dyckman Street, for the erection of a two-story garage and service works, estimated to cost $200,000 with equipment.

The Studebaker Corporation of America, 1700 Broadway, New York, has leased a building at 9-11 Smith Street, Jamaica, L. I., for a new service branch. About 11,000 sq. ft. of floor space will be given over for service, repair shop and garage.

The Adirondack Electric Power Corporation, Schenectady, N. Y., will commence the construction of an addition to its steam-operated generating plant at Amsterdam, N. Y., to cost about $150,000.

The Stewart-Warner Speedometer Corporation, 1928 Diversey Parkway, Chicago, has acquired the plant and property of the Jones Speedometer, Inc., New Rochelle, N. Y., heretofore an interest of Johns-Manville, Inc., New York, and will continue the plant in operation. The purchasing company also has construction in progress on an addition to its Chicago plant aggregating 156,000 sq. ft.

Charles & Co., 48 East Forty-third Street, New York, grocers, have purchased property at First Avenue and Forty-fourth Street, 100 x 175 ft., as a site for a service and repair building for company motor trucks and cars, and distributing warehouse, estimated to cost $750,000 with equipment.

The E. F. Howell Mfg. Co., 222 Union Street, Hackensack, N. J., manufacturer of plumbing equipment, pipe, etc., has awarded a general contract to the W. H. Whyte Construction Co., 382 Railroad Avenue, for a two-story and basement addition, 72 x 115 ft. H. A. Phillips, 404 Hillside Avenue, Nutley, N. J., is architect.

Fire, Feb. 12, destroyed a portion of the plant of the Titan Miniature Lamp Co., Bloomfield, N. J., occupying leased quarters at 283-87 Glenwood Avenue, manufacturer of electric lights, with loss estimated at $43,000, of which about $23,000 represents machinery. It is proposed to re-

establish the works in another location. Frank M. Merrick is president.

The National Fireproofing Co., Fulton Building, Pittsburgh, has awarded a contract to the Belmont Iron Works, Philadelphia, for three buildings at Keasbey, N. J., to replace its plant destroyed by fire last October with loss in excess of $300,000. W. Guy Weaver is district manager.

The Weston Electric Co., Weston Avenue, Newark, manufacturer of electric measuring instruments, has filed plans for a one-story factory addition.

The James Ore Concentrator Co., 35 Runyon Street, Newark, manufacturer of concentrating machinery, is considering the erection of a new plant for experimental and other work, to cost more than $250,000 with machinery. U. S. James is head.

William E. Quimby, 5 Avenue C, Newark, manufacturer of electric pumping machinery, will commence the erection of a two-story addition to his plant at 219 Parkhurst Street, 30 x 56 ft., estimated to cost $23,000. W. Frank Bower, 137 Main Street, East Orange, N. J., is architect.

Manual training equipment will be installed in the three-story and basement high school to be erected at Clinton Avenue, Irvington, N. J., estimated to cost $500,000 with equipment. Donn Barber, 101 Park Avenue, New York, is architect.

The Pennsylvania Pump & Compressor Co., Easton, Pa., is in the market for a second-hand 7-A Potter & Johnson automatic chucking and turning machine.

Manual training equipment will be installed in a two-story high school to be erected on the Boston Post Road, Mamaroneck, N. Y., estimated to cost $475,000. Bids will be asked at once on a general contract. Edward Hahn, 290 Fulton Street, Hempstead, L. I., is architect.

The Ferracute Machine Co., Bridgeton, N. J., is in the market for an electric crane of 7½ or 10 tons capacity, 46 ft. 8 in. span, 220 volts, direct current.

F. H. Crawford & Co., 299 Broadway, New York, is inquiring for a small used mill for grinding quartz.

Philadelphia

PHILADELPHIA, Feb. 18.

PLANS have been completed by the Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, for additions in its repair and maintenance shops at Twenty-sixth and Christian Streets, to cost $50,000. John T. Windrim, Commonwealth Building, is architect.

The J. G. Brill Co., Sixty-second and Woodland Streets, Philadelphia, manufacturer of traction cars and trucks, has arranged an appropriation of $100,000 for the development and expansion of a new branch of production, covering the manufacture of automobile buses and parts. Samuel M. Curwen is president.

Bids have been asked by the Board of Trustees, University of Pennsylvania, Thirty-fourth and Woodland Streets, Philadelphia, for the construction of its proposed steam-operated electric power plant on the Schuykill River, to cost approximately $100,000. Thomas, Martin & Kirkpatrick, Otis Building, are architects. McClelland & Junkersfeld, 45 William Street, New York, are engineers.

The Columbia Steel Equipment Co., Third and Wingehocking Streets, Philadelphia, manufacturer of steel office furniture, etc., has plans for a one-story addition, 100 x 105 ft. J. Frank Clark, 23 South Fifteenth Street, is architect.

The Sun Oil Co., Finance Building, Philadelphia, will commence the construction of a new storage and distributing plant on Terminal Way, Providence, R. I., for lubricating oils, with main two and three-story building, 90 x 100 ft. tank house, power house and other structures, to cost $100,000 with equipment.

The Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, has awarded a general building contract to Franklin M. Harris & Co., 1520 Parrish Street, for a power house at Race and Fifty-sixth Streets, estimated to cost $50,000. John T. Windrim, Commonwealth Building, is architect.

In connection with its new plant at West Philadelphia, occupying buildings previously used by the Government, the Willys-Overland Co., Toledo, Ohio will provide equipment for an initial assembling of 100 cars per day, to be developed to a maximum of 200 cars per day in the near future. The floor area totals 160,000 sq. ft., and employment will be given to about 300. It is expected to commence operations at an early date.

Stetler & Deysher, 1015 Chestnut Street, Philadelphia, architects, are preparing plans for a four-story automobile service and repair building, 100 x 150 ft., on Pine Street, to cost $150,000 including equipment, for a company whose name will be announced later.

The Delaware County Electric Co., Chester, Pa., has completed plans for an addition to its power house at Marcus Hook, Pa., including improvements in the existing station, and will commence work at an early date. John T. Windrim, Commonwealth Building, Philadelphia, is architect.

The Frankford Grocery Co., Frankford Avenue and Unity Street, Frankford, Philadelphia, will build a one and four-story automobile and service repair building for company motor trucks and cars and distributing plant to cost $100,000. W. E. S. Dyer, Land Title Building, is architect and engineer. J. August Edgar is president.

The York Paper Mfg. Co., York, Pa., recently organized with a capital of $135,000, will operate a plant for the manufacture of roofing and other building materials. Charles and Jacob Lefean, York, head the company.

The Chantrell Tool & Hardware Co., Reading, Pa., will commence the construction of a new plant at Millmont, Pa., to be three stories, estimated to cost $55,000 exclusive of equipment.

The Mifflin Electric Service Co., and the Berrysburg Electric Service Co., Clearfield, Pa., have been organized by the same interests to construct and operate electric power plants and systems in this vicinity. A. J. Musser, Indiana, Pa., is treasurer of both organizations.

Manual training equipment will be installed in the proposed two-story and basement high school to be erected at Windber, Pa., estimated to cost $175,000, for which bids will be asked on a general contract in the near future. Henry L. Reinhold, Jr., 1513 Walnut Street, Philadelphia, is architect.

The Candlemas Coal Co., Silver Brook, near Hazleton, Pa., is planning for the installation of electric-operated pumping machinery and other electric power equipment at its local plant. The entire works will be electrified.

Fire, Feb. 11, partially destroyed a number of plants in the industrial district at Lancaster, Pa., including the forge and blacksmith shop of Harry Frailey; planing mill of Frey & Son; and factory of Louis Fritz Service Sign Co., with total loss estimated at $27,000, with equipment. The different interests plan to rebuild.

The Meadowfield Lumber Co., Inc., Pottsville, Pa., is planning for the purchase of a log-loading machine and two industrial locomotives, each 30-ton capacity, 36 in. gage. L. T. Brandon is secretary.

Roley Brothers, Belle Vernon, Pa., have plans for a two-story automobile service and repair building, 60 x 110 ft., to cost $55,000, with equipment. H. Ernest Clark, 472 Donner Avenue, Monessen, Pa., is architect.

The Pennsylvania Railroad Co., Broad Street Station, Philadelphia, is said to have arranged a fund of $3,000,000 for its car and locomotive shops at Altoona, Pa., on which work is now in progress, including equipment.

The Hahn Motor Truck Co., Hamburg, Pa., has purchased a site on North Seventh Street, Allentown, Pa., and will erect a two-story, 60 x 120 ft. factory branch, sales and service station.

Buffalo

BUFFALO, Feb. 18.

FOLLOWING Court action, the Kensington-Davis Corporation, 144 Kensington Avenue, Buffalo, has secured permission, over the protest of the City Council, to construct a one-story foundry addition, to cost $125,000 with equipment, and will proceed at once with the work.

The Lockport Light, Heat & Power Co., Lockport, N. Y., has arranged for an increase in capital from $1,500,000 to $3,000,000, a portion of the proceeds to be used for extensions and improvements.

S. Lipowitz, 1078 Broadway, Buffalo, plans the purchase of a drill press, cylinder grinder and other tools for installation in his two-story automobile service and repair building at 750-60 Fillmore Avenue, for which bids are being taken on a general contract.

In connection with the recent purchase of the National Car Wheel Co., the American Brake Shoe & Foundry Co., 30 Church Street, New York, will take over the Rochester, N. Y., works of the company, and plans to develop operations to maximum. The acquired company will be operated as a separate unit.

The Consolidated Brick Co., Horseheads, near Elmira, N. Y., is said to be arranging a fund of $150,000 for rebuilding its local plant recently destroyed by fire, to include a one-story machine building, 50 x 80 ft., one-story kiln department, 50 x 800 ft., power department, etc. G. Prindibble, Patton, Pa., is president, in charge.

Joseph J. Luraschi, 138 St. James Place, plans to pur-

chase a drill press, bench tools and other equipment for the repair department at his proposed one-story automobile service building, 96 x 100 ft., at Front Avenue and Hudson Street, for which plans are in progress.

Henry & Allen, Auburn, N. Y., are in the market for a Pratt & Whitney 14-in. vertical surface grinder, belt-driven and with complete equipment, including countershaft and rectangular magnetic chuck, and with working surface dimension 10⅜ x 31 in.

Two 500 kw. automatic power substations will be constructed at Stow and Glen Ewen, N. Y., along the lines of the Jamestown, Westfield & Northwestern Railway and the Chautauqua Traction Co., Jamestown, N. Y. Power equipment will be purchased. George L. Maltby is superintendent of the companies.

Eugene M. Satterlee, 68 Church Street, Salamanca, N. Y., plans the establishment of a factory to manufacture a patented carburetor adjustment for automobiles and desires quotations on machinery and equipment.

Chicago

CHICAGO, Feb. 18.

ADDITIONAL inquiries from the Santa Fe bring the total number of items on which it has thus far asked for prices up to 106. No other railroad inquiries are reported and buying by industrial companies is limited to scattered purchases of individual machines. The National Plate Glass Co.'s inquiry is still pending, although orders are expected to be placed at any moment. Wilson & Co., packer, Chicago, have taken figures on two engine lathes, a shaper, a milling machine, two pipe machines, a hack saw, an emery stand and upright drilling machines to replace equipment in a repair shop recently destroyed by fire.

Sales of used equipment continue to play an important part in the market. While it is true that most of the surplus machine tools left over from the war period have been absorbed, the liquidation of the equipment of industrial plants which have discontinued operations continues to command attention. A large farm implement manufacturer is reported to have bought 200 machine tools, which are included in the equipment of the Moline, Ill., plant of the Moline Plow Co.

Additions to Santa Fe List

One 26-in. x 12-ft. Boye & Emmes, or equivalent, triple-geared motor-driven engine lathe.

Two 16-in. x 6-ft. Lodge & Shipley, or equivalent, portable motor-driven engine lathes.

One belt-driven 1½-in. x 24-in. Hartness, or equivalent, flat turret lathe.

One motor-driven, Cincinnati Acme, or equivalent, universal turret lathe.

One 24-in. x 12-ft. Boye & Emmes, or equivalent, selective head, heavy duty type motor-driven engine lathe.

The Whiting Corporation, Harvey, Ill., has taken the following orders for foundry equipment: No. 4 cupola for the Sparta Foundries Co., Sparta, Mich.; No. 8 cupola for the Republic Boiler & Radiator Co., Baltimore; No. 5 cupola for the Seybold Machine Co., Dayton, Ohio; six tumbling barrels for the American Seating Co., Chicago, and eight brass furnaces for the Great Western Smelting & Refining Co., Detroit.

The Reiter Boiler Cleaner Co., Elgin, Ill., has purchased the plant formerly occupied by the Elgin Stove & Oven Co., at 59 North Street in that city, and is moving its manufacturing equipment to that location. The Elgin company has moved into a new plant on the North State Street Highway.

The Sanitary Scale Co., 565 West Washington Boulevard, Chicago, has retained C. W. Bradley, architect, Rockford, Ill., to draw plans for a factory employing 100 to be built at Belvidere, Ill. Construction work on the first unit, to cost about $25,000, will begin as soon as weather permits in the spring. The company manufactures scales for use in meat markets and groceries. Up to the present time the plant in Chicago has been used for the assembly of parts, most of which have been made by Belvidere and Woodstock companies.

The Wolff Mfg. Corporation, 225 North Hoyne Avenue, Chicago, manufacturer of sanitary ware and plumbing supplies, has awarded contract to the Austin Co., Cleveland, to design and construct an enameling plant, 125 x 156 ft., to cost $100,000. It has also been awarded contract to remodel the company's building at the corner of Robey and Fulton Streets, now used as a storage warehouse, for use as a brass foundry and light machine shop.

AT the Front of This Airplane Engine Is a General Electric Co. Super-Charger Designed to Give the Engine at High Altitude the Same Density of Oxygen for Combustion as It Would Obtain Naturally Near the Level of the Earth. This equipment is rated to feed sea level atmospheric pressure up to a height of 35,000 ft. It is a turbine compressor, operated from the exhaust gases of the motor, and weighs about 140 lb. At 35,000 ft. elevation, its operation will increase the power of the motor by about 280 hp., or 2 hp. for each pound carried

The Republic Flow Meters Co., 2240 Diversey Parkway, Chicago, has awarded contract for a two-story addition to cost $31,500.

The Vaughan Novelty Co., 3211 Carroll Avenue, Chicago, has awarded contract for a one-story plant, 46 x 50 ft., at that address, to cost $10,000.

The Chicago Steel & Wire Co. has awarded contract for a one-story addition, 110 x 390 ft., at East 103rd Street and Torrence Avenue, to cost $80,000.

S. D. Childs & Co., printers, 136 South Clark Street, Chicago, have awarded contract for a three-story printing plant, 80 x 100 ft., at 15 North Sheldon Street, to cost $100,000.

The Johnson Iron Works, 1133-41 Cornelia Avenue, Chicago, has placed contract for a one-story plant, 40 x 100 ft., at that address, to cost $12,000.

The Roll Fold Tub Rack Co., Peoria, Ill., recently incorporated, has leased a plant for the manufacture of a roll fold wash tub rack and is in the market for a used punch press. Officers are: President, H. T. Stroop; vice-president, A. F. Hauser; secretary-treasurer, Julius Hammer.

The Kulp Theft-Proof Lamp Co., 143 West Austin Avenue, Chicago, recently incorporated, has installed automatic machines for the manufacture of theft-proof electric bulbs. Lester Kulp is president.

The machine shop of the plant of the Bradford Corporation, manufacturer of railroad supplies, 9301 Drexel Avenue, Chicago, was recently destroyed by fire. The factory was formerly owned by the Joliet Railway Supply Co., which was recently purchased by the Bradford Corporation, which has general offices at 80 East Jackson Boulevard.

M. O'Conner, 143 West Kinzie Street, Chicago, is in the market for several power operated powder mixing machines.

The Mutable Mfg. Co., 127 West Washington Street,

Chicago, incorporated with $500,000 capital stock to manufacture metal toys, plans to erect a building, 175 x 250 ft., at Gary, Ind. It will be in the market for a number of wood-working lathes, punch presses and a few light drilling machines. Charles E. Dobbins is president; H. N. Dobbins, vice-president, and Edward F. Kaul, secretary-treasurer.

The Common Council, Crete, Neb., has called a special election on March 11 to vote bonds for $45,000 for the installation of a municipal electric light and power plant. C. E. Beals is city clerk.

The Standard Oil Co. of Indiana, Indianapolis, is planning the construction of a distributing plant, shops and service building for company motor trucks at Mankato, Minn., estimated to cost $135,000 with equipment. J. J. Meyer is local representative.

The Lignite Coal & By-Products Co., Minneapolis, Minn., K. A. Loven, vice-president and general manager, is planning for a new lignite coal and by-products works at Richardton, N. D., to cost approximately $350,000 including equipment. The initial unit, on which work will soon commence, will cost approximately $130,000.

The Holt Motor Co., East Kemp Avenue, Watertown, S. D., is having plans prepared for a one-story service and repair building, 60 x 100 ft., estimated to cost $85,000 including equipment.

The Morden Frog & Crossing Works, 208 South La Salle Street, Chicago, has awarded a general contract to the Chicago Heights Construction Co., Chicago Heights, for a one-story addition to its plant at Chicago Heights, 100 x 240 ft., to cost $100,000. It will be equipped as a machine shop and saw mill. George C. Nimmons & Co., 122 South Michigan Avenue, is architect and engineer.

A. W. Johnson, city clerk, Galva, Ill., will receive bids until March 4 for one 125- and one 40-kva. generator, crude-oil engine driven; two centrifugal pumps, each with capacity of 500 gal. per min., and one compound air compressor, with capacity of 375 cu. ft. of free air per min. The J. D. Rankin Co., Chicago, is consulting engineer.

Pittsburgh

PITTSBURGH, Feb. 18.

MACHINE tool orders in this district are small by comparison with the volume of inquiry and pending projects. The trade takes a cheerful view of the outlook, however, and expects orders to gain perceptibly in the near future. What is true of machine tools is in a large degree true of the crane market and probably more than 100 cranes of various sizes are pending. This includes those required in the construction and plant betterment program of the Steel Corporation, which amounts to more than half that number. Outside of the cranes for the Homestead works, Carnegie Steel Co., which will in all probability be built by the company itself at that plant, the chances are bright for much of this business coming out soon and going to regular builders.

Considerable activity marks the power equipment market. The Aluminum Co. of America recently placed a 27,500-hp. hydraulic turbine for its subsidiary, the Tallassee Power Co., Baden, N. C., and one 1875-kw., 120-turn, 30-cycle alternator for another subsidiary, the Aluminum Ore Co., East St. Louis, with the Allis-Chalmers Mfg. Co. The Charles B. Hawley Co., Oakland, Md., has bought from the same company two 12,000-hp. hydraulic turbines together with a complete crushing plant. The Carnegie Steel Co. has bought a 1000-hp. pump motor for its Ohio works, Youngstown, from the Allis-Chalmers company, and the Universal Steel Co., Bridgeville, Pa., has bought a 500-hp. Allis-Chalmers motor to drive an 8-in. bar mill. The Penn Valley Coal Co., Youngwood, Pa., recently closed for a 300-kw. rotary converter, with transformers, etc., from the Allis-Chalmers Mfg. Co.

The Rust Engineering Co., Pittsburgh, has been awarded contract for the construction of the new water filtration plant for Fairmont, W. Va. The Roberts Filter Mfg. Corporation, Philadelphia, has been awarded contract for the filtration equipment.

The Laurel Co., Charleston, W. Va., operating a plant for the manufacture of brass, aluminum, copper and other metal products, has tentative plans for the installation of additional equipment, including motors and other electric power apparatus. The company was organized recently with J. L. Pullen as president, and E. S. Sites, secretary.

The Pittsburgh Plate Glass Co., Frick Building, Pittsburgh, has disposed of about 14 acres with buildings, in Jefferson Township, to the Mississippi Glass Co., 220 Fifth Avenue, New York. The new owner specializes in the production of rough and ribbed glass, and it is said will use the site for a new plant.

The Tourist's Garage Co., P. O. Box 330, Charleston, W. Va., recently organized with a capital of $100,000, has plans for a two-story service and repair building, 85 x 225 ft., estimated to cost $75,000. Knapp & Haviland, Charleston, are architects and engineers. F. W. Johnston is president and treasurer.

The Guyan Machine Shops, Logan, W. Va., machinery dealer, is said to be in the market for a slitting shear and punch, with shears capable of handling ⅜-in. stock.

The Mercer Garage & Auto Sales Co., Scott Street, Bluefield, W. Va., has preliminary plans for a four-story addition, 30 x 135 ft., to its service and repair building, to cost more than $100,000 with equipment. J. F. Willis is manager.

The Transcontinental Oil Co., Benedum-Trees Building, Pittsburgh, is perfecting plans for a preferred stock issue to total about $15,750,000, a portion of the proceeds to be used for the development of Western properties and the installation of additional equipment. F. B. Parriott is president.

Fire, Feb. 12, destroyed a portion of the four-story plant of the Myers Carriage Co., Franklin, Pa., manufacturer of carriages, automobile bodies, etc., with loss estimated at $50,000, including equipment. It is planned to rebuild.

The West Virginia Power & Transmission Co., 14 Wood Street, Pittsburgh, a subsidiary of the West Penn Railways Co., same address, will build a hydroelectric generating plant on the Cheat River, West Virginia, about one mile below the Monongalia-Preston County line. The initial project will cost $1,000,000.

Cleveland

CLEVELAND, Feb. 18.

ORDERS for machine tools are not holding up as well as last month, but there is a good volume of new inquiry for single machines and small lots. No lists of any size are pending. The Ford Motor Co. has purchased three more planing machines for its River Rouge plant. However, there is very little activity on the part of other Detroit automobile manufacturers. Automatic screw machines continue to move well in orders for single machines in small lots. Dealers are booking a fair volume of business from well scattered sources and almost entirely for single machines.

Machinery equipment will be required shortly for service shops to be established in Cleveland and Cincinnati by the General Electric Co., which will also require two electric traveling cranes for these shops. The used machinery in the automobile department of the Winton Co., Cleveland, amounting to over 200 tools is being placed on the market owing to the decision of that company to discontinue the manufacture of automobiles.

The demand for electrical equipment is fairly heavy. The General Electric Co. has taken two 30,000-kw. steam turbines for the power plant of the American Gas & Electric Co., Philo, Ohio, and the Westinghouse Electric & Mfg. Co. has taken a 10,000-kw. steam turbine for enlarging the power plant of the McKinney Steel Co., Cleveland. Inquiries for electric traveling cranes show an improvement.

The Reinhard Electric Motor Co., Cleveland, recently organized, has established a plant at 2517 East Seventy-ninth Street for the manufacture of small sized industrial motors. These will include squirrel cage, slip ring and multispeed polyphase induction motors of from ¾ to 20 hp. and 1800 r.p.m. G. A. Reinhard is president, J. J. Laughlin, secretary, and C. Kalvalage, treasurer.

The Martin-Perry Co., York, Pa., manufacturer of motor truck bodies, has established a branch assembly plant at 5103 Lakeside Avenue, Cleveland.

The Sanitary Tinning Co., 3753 East Ninety-third Street, Cleveland, will build a new one-story plant, 54 x 104 ft. Bohnard & Parson, 1900 Euclid Building, are the architects.

The Kirk-Latty Mfg. Co., Cleveland, manufacturer of bolts, nuts and rivets, will build a one-story plant extension, 25 x 219 ft.

The Chicago Pneumatic Tool Co. has taken bids for a three-story 45 x 126 ft. extension to its plant on East Forty-

Ninth Street and Lakeside Avenue, Cleveland. The Austin Co., Cleveland, is the structural engineer.

The Nickel Plate Foundry Co., Cleveland, has awarded contract to the A. A. Lane Construction Co., 1889 East Fifty-fifth Street, for its new foundry. The owner will take bids later for a cupola and blowers. The H. W. Morse Co., Finance Building, is the architect and engineer.

The Libbey-Owens Sheet Glass Co., Toledo, is taking bids for a new $1,000,000 plate glass plant which will be a one-story, 187 x 1002 ft. Lockwood, Greene & Co., Boston, and Hanna Building, Cleveland, are the architects and engineers. The equipment required will include fans, pumps, cranes, sand handling and conveying equipment and sand grinding machinery, for which the architects will soon take bids.

Plans for the new foundry to be built by the Bowler Foundry Co., Cleveland, at an estimated cost of $200,000, are being prepared by A. G. Simon, Hippodrome Building. It will be one-story, brick, about 200 x 400 ft.

The Schwenger-Klein Co., 5201 Denison Avenue, Cleveland, manufacturer of butchers' supplies and store fixtures, will shortly begin the erection of a one-story machine shop, 90 x 80 ft.

The Osgood Co., Marion, Ohio, has commenced the erection of a one-story forge shop, 60 x 112 ft.

The American Fork & Switch Co., Hampton, Ohio, has commenced the erection of a one-story addition, 75 x 100 ft.

A high school building that will be equipped with chemical and physical laboratories and for which 20-hp. fan motor and other equipment will be required will be erected by the St. Joseph Academy Sisters of Notre Dame, Columbus, Ohio. Howard W. German, Schwind Building, Dayton, Ohio, is the architect.

Manual training and vocational equipment will be installed in the new $250,000 high school to be erected in Mayfield Township, Cuyahoga County, Ohio, for which the County Board of School Trustees is in charge.

The Simpson Creek Collieries Co., Cleveland, has been organized by officials of the Youghiogheny & Ohio Coal Co., Hanna Building, Cleveland, for the development of 2700 acres of coal lands in Taylor and Barbour counties, W. Va. Machinery to include transmission and conveying equipment will be installed. H. L. Findlay is president of the company.

The Hoover Suction Sweeper Co., North Canton, Ohio, has awarded contract to the Hunkin-Conkey Construction Co., Cleveland, for a three-story addition, 80 x 300 ft., a new die house, 100 x 150 ft., and a new foundry and administration building. Contract will approximate $1,000,000 and a list of machinery will be arranged.

Manual training and other vocational equipment will be required for the two new junior high schools to be erected at Findlay, Ohio, for which bids are being received by the Board of Education on a general contract until March 14.

Manual training and vocational equipment will be installed in the two new schools to be erected at Akron, Ohio, to be known as the Garfield school and the Robinson school annex, estimated to cost $650,000. H. T. Walker, president of the Board of Education is in charge.

The Broden & Dailey Construction Co., Cleveland, engineer and builder of wire mill equipment, has taken complete contract for the new wire mill being erected by the Wheeldon Wire Co., West Brookfield, Mass. All machinery has been ordered and the plant is expected to be in operation within 60 days.

St. Louis

ST. LOUIS, Feb. 18.

TENTATIVE plans are being considered by the Hayes Equipment Co., 624 East Gilbert Street, Wichita, Kan., for a one-story and basement addition, 100 x 150 ft., estimated to cost $55,000 including equipment.

The California Pipe Line Machine Co., Kansas City, Mo., has plans for a new factory at Fourteenth and Chestnut Streets, one-story, 100 x 135 ft., estimated to cost $27,000. A portion of the structure will be occupied by the Unit Motor Co. J. J. Mahoney is head.

The Mutual Oil Co., Kansas City, Mo., has concluded negotiations for the purchase of the Continental Oil Co., Denver, Colo., with refining plant at Florence, Colo. The purchasing company will reorganize under its present name, with increased capital to $30,000,000, and consolidate the Continental property. The Mutual company operates refineries at Chanute, Kan.; Glen Rock and Cowley, Wyo. Plans are under way for expansion in the properties. S. H. Keoughan, Denver, will be president of the new organization, succeeding O. H. Williams.

The Missouri Marble Quarries, Inc., Boatmen's Bank Building, St. Louis, recently organized to take over marble properties in Jefferson County, Mo., is said to have perfected arrangements for the purchase of the plant of the Thym Cut Stone Co., Odell and Brannon Avenues, St. Louis. Plans are under way for the construction of new buildings and the installation of cutting, polishing and other machinery estimated to cost $90,000. H. A. Preuss is secretary, in charge.

The Hot Springs Ice & Cold Storage Co., Hot Springs, Ark., recently formed with a capital of $75,000, has plans for the construction of an ice-manufacturing plant with initial output of about 30 tons per day; a cold storage plant will also be established. Samuel G. Smith is president, and F. L. Thompson, secretary.

Manual training equipment will be installed in the three-story and basement high school to be erected at Rexford, Kan., estimated to cost $100,000, for which bids will be asked at an early date on general contract. Smith & English, Nelson Building, Hutchinson, Kan., are architects.

The Arkansas Brick & Tile Co., Little Rock, Ark., is perfecting arrangements for rebuilding its local plant, recently destroyed by fire. The works will include a machine department, steam power house and other structures, with the installation of disintegrators, pug mills, electric power and other equipment. Consideration will be given to the construction of standardized steel buildings and the company is interested in information regarding such structures.

The Oklahoma General Power Co., Oklahoma City, Okla., has work in progress on a new generating plant near Harrah, Okla., to have an initial capacity of 20,000 hp. It is planned to commence the installation of machinery soon and have the station ready for service in the summer.

The St. Joseph Water Co., St. Joseph, Mo., has preliminary plans for the installation of electric-operated pumping machinery and other power equipment at its plants in connection with extensions to cost approximately $500,000.

The Public Service Co., Tulsa, Okla., will commence superstructure work for a one-story and basement addition, 72 x 115 ft., at its ice-manufacturing plant on Eleventh Street, to cost $40,000. The Pittsburg-Becker Engineering Co., St. Louis, is architect and engineer.

The Common Council, Nowata, Okla., is planning the installation of electric-operated pumping machinery in connection with extensions in the municipal waterworks, for which a bond issue of $75,000 has been approved. Oscar Dobbs is city manager.

The Atlas Iron Works, Slevin and Geraldine Avenues, St. Louis, has inquiries out for a used 5 to 10-ton, 50 to 70-ft. span, electric traveling crane.

Detroit

DETROIT, Feb. 18.

PLANS have been completed by the Wolverine Tube Co., 1411 Central Avenue, Detroit, manufacturer of seamless brass tubing, for a two-story addition, 60 x 155 ft., estimated to cost $60,000. Esselstyn & Carey, 2539 Woodward Avenue, are architects and engineers.

The Consumers Power Co., Jackson, Mich., is arranging a fund of $15,000,000 for extensions and betterments during the year. The work will include an additional unit at the steam-operated generating plant at Battle Creek, completion of a 60,000 hp. steam-operated electric power plant on the Saginaw River; hydroelectric generating plant on the Au Sable River, Alcona power site; extensions in plant and system at Grand Rapids, to cost $2,000,000, and at Jackson, estimated to cost $725,000. It is also proposed to construct about 150 miles of steel tower transmission lines.

The C. G. Spring Co., Kalmazoo, Mich., manufacturer of automobile springs, etc., has disposed of a new preferred stock issue of $550,000, a considerable portion of the proceeds to be used for an expansion program during the year.

Manual training equipment will be installed in the two-story and basement high school to be erected at Zeeland, Mich., estimated to cost $135,000. Ernest S. Batterson, Hanselman Building, Kalamazoo, Mich., is architect.

The Board of Works, Detroit, will proceed with plans for the construction of a municipal electric generating plant, held in abeyance for a number of months. It is estimated to cost $11,600,000 and is to be ready for operation by the fall of 1926.

The Peerless Portland Cement Co., First National Bank Building, Detroit, with plant at Union City, Mich., has awarded contract to the Traylor Engineering & Mfg. Co., Allentown, Pa., for grinding and affiliated equipment for its new mills on 14-acre site at River Rouge, recently purchased. Orders for other machinery will be placed in the near future. The new plant will cost $3,000,000. John Gillespie is president and A. L. Miller, construction engineer.

The Fisher Body Corporation, General Motors Building, Detroit, has acquired the plant and property of the Mans-

field Steel Corporation, Mansfield Avenue, bankrupt, at a receiver's sale, for $250,000. The new owner plans to remodel for the manufacture of automobile bodies.

The city of Petoskey, Mich., plans to erect a municipal light and water works plant.

The John W. Ladd Co., 2016 West Lafayette Street, Detroit, manufacturer of dairy machinery, has awarded a general contract to William N. Miller, Dertoit, for a one-story addition to cost $25,000. Esselstyn & Murphy, Marquette Building, are architects.

A one-story steam power house, 30 x 60 ft., will be erected at the school at Superior and Tenth Streets, Wyandotte, Mich., to cost about $35,000. John Finn & Son, 7720 Plymouth Road, Detroit, are architects and engineers.

The Lincoln Motor Co., Detroit, has completed a new plant addition, totaling 388,000 sq. ft., to be used entirely as a machine shop.

Cincinnati

CINCINNATI, Feb. 18.

THOUGH the volume of business booked is showing a slight increase, inquiries are still far ahead of orders. There is, however, more encouragement in the outlook, as numerous deals which have been holding over for some time are now being closed. Current inquiries indicate that many tools are needed and buying is expected to develop soon. Several large projects are pending, including $1,000,000 worth of equipment for a new brass foundry and manufacturing plant for the Standard Sanitary Mfg. Co. at Louisville, Ky. This company also is expected to commence placing orders during the week for its new plant at Baltimore, and the Big Four Railroad is expected to close its list for various shops.

The Dodge Brothers Motor Car Co. was a good-sized purchaser the past week and an electrical generating company in Indiana bought a number of tools. The Cincinnati & Ohio Railroad is in the market for a number of engine lathes, and the Lynchburg Pipe & Foundry Co. is taking bids on a number of tools. While the business placed this year to date has been somewhat disappointing, prospects for the future are bright, judged by outstanding inquiries. Used machinery dealers report sales more numerous, with fair prices being obtained.

The Fulflo Specialties Co., Blanchester, Ohio, is in the market for a good, used planer, about 30 in. x 30 in. x 8 ft. A. E. Clifton is president.

The American Auto Repair Co., Cincinnati, has awarded contract for the erection of a garage on Colerain Avenue, to cost approximately $15,000. A number of machine tools will be installed.

The Sani-Unit Mfg. Co., Dayton, Ohio, recently incorporated, is contemplating the erection of a factory to manufacture dental supplies. Dr. P. E. Gabel, 900 Fidelity Building, is president.

The Oxygen Equipment Co., Chicago, will erect a branch plant at Portsmouth, Ohio, contract for which has been let, to cost with equipment approximately $75,000. It will manufacture oxygen for the Portsmouth works of the Wheeling Steel Corporation.

The Athens Foundry & Machine Co., Athens, Ohio, has been sold to E. E. Jacobs, Athens, and the name will be changed to the Athens Foundry & Repair Co. It is the intention of the new company to manufacture mine cars and other mining equipment. Repairs and additions will be made and the force more than doubled.

The Lucas Pump & Tool Co., Dayton, Ohio, manufacturer of air compressors, is considering additions to its plant to double its capacity. Joseph Westendorf is president.

The Washington Motors Co., which recently moved its plant from Eaton, Ohio, to Middletown, Ohio, will engage in the manufacture of steam cars, having acquired the patents and rights from Arnold Larsen, Norwegian inventor of the steam car. It is expected that production will start about March 1.

The Morrow Mfg. Co., Wellston, Ohio, manufacturer of mining equipment, is contemplating the erection of a foundry, plans having been prepared but no final decision made. The company recently installed considerable equipment to increase its manufacturing facilities, and expects to double its output this year. Jerry Morrow is president.

The veneer mills of the Mengel Co., Louisville, located at Hickman, Ky., were practically destroyed by fire Feb. 14, the loss being estimated at $800,000. Arthur D. Allen, president, reports that definite decision has not been made as to whether the mills will be rebuilt.

Manual training and vocational equipment will be installed in the new high and grammar school to be erected at Englewood, Tenn., for which the School Board of Trustees is in charge. It will cost about $75,000.

The Crane Enamelware Corporation, Chattanooga, Tenn., has increased its capital stock from $2,000,000 to $3,500,000. A portion of the proceeds will be used for plant enlargements and improvements. R. T. Crane, Jr., heads the company.

The city of Nashville, Tenn., contemplates building a municipal garage estimated to cost $400,000, in which transmission, conveying and shop equipment will be installed. Mayor Hilary E. Howse is in charge.

Electrical pumping and auxiliary equipment will be required in extensions and improvements contemplated to the waterworks at Morristown, Tenn., estimated to cost $110,000. J. F. Mathes is superintendent of the Water Department and in charge of operations.

The Jackson Railway Light & Power Co., Jackson, Tenn., is planning for enlargements in its steam-operated power plant, including the installation of a 2000 kw. generator and auxiliary equipment, estimated to cost $100,000.

The Dempster Equipment Co., Inc., 721 North Central Avenue, Knoxville, Tenn., recently organized, is planning the establishment of works for rebuilding steam shovels and other heavy railroad and contracting equipment. George A. Dempster is president.

The Charles Boldt Glass Co., Cincinnati, manufacturer of hollowware products, has plans under way for extensions in its branch plant at Huntington, W. Va. It is proposed to dismantle a portion of the Cincinnati works, removing the equipment to the Huntington plant, where additional apparatus will be installed. Headquarters will be continued at Cincinnati.

Edward Fowler and F. E. Lewis of the Fowler-Lewis Cultivator Co., Chattanooga, Tenn., are planning for the organization of a new company to build an oil-reclaiming plant at St. Elmo, Tenn. The initial unit will cost about $55,000, including machinery.

The Common Council, Lawrenceburg, Tenn., is arranging a special election on April 14, to vote bonds for the installation of a municipal hydroelectric power plant.

The Kentucky Box & Crate Co., Inc., Henderson, Ky., is in the market for a gang circular rip saw, disk sander, band saw, surface planer and other equipment.

The Kentucky Utilities Co., Louisville, has acquired the electric power and ice-manufacturing plants of the Lebanon Light, Ice & Power Co., Lebanon, Ky. Plans are under way for extensions and the installation of additional equipment.

Work has started on the three-story 80 x 96 ft. addition to the plant of the Cleveland Chair Co., Cleveland, Tenn. The company will electrify its plant throughout, and will install individual motors and replacement machinery as conditions warrant.

Milwaukee

MILWAUKEE, Feb. 18.

THE machine-tool trade is more active than at any time since Jan. 1, although demand is not yet equal to the average of the early months a year ago. Orders still consist of single tool purchases. Competition from used tools is keen, with a considerable amount in excellent condition and modern design available. The trustee of the defunct Mitchell Motors Co., Racine, is offering for quick disposition the entire remaining tools, consisting of lathes, screw machnes, drill presses, multiple drills, grinders, gear cutters, milling machines and turret lathes. It is stated that these must be sold by March 1, when the buildings must be vacated in favor of the Nash Motors Co., Kenosha, Wis.

The Aluminum Goods Mfg. Co., Manitowoc, Wis., with branch factories in Two Rivers, Wis.; Newark, N. J., and St. Louis, Mo., contemplates further enlargement of its main factory at Manitowoc, and has engaged Lockwood, Greene & Co., 38 South Dearborn Street, Chicago, to prepare estimates. The addition, it is stated, will be a production unit, but details are not yet available. George Vits is president and general manager.

The Greiner-Nash Co., Kenosha, Wis., Nash and La-Fayette dealer, plans the erection of a $75,000 sales and ser-

vice building, 82 x 146 ft., two stories and basement, designed by White, W hite & White, local architects, who will take bids after March 15.

The Texas Co., 209 Jackson Street, Milwaukee, let the general contract to the McKelvy Construction Co., 426 Hammond Building, Detroit, for the erection of a storage, warehouse and distributing plant costing about $65,000, town of Wauwatosa, Milwaukee. The contract for steel tanks has been sublet to the Reeves Brothers Co., Alliance, Ohio. Mechanical equipment, including pumps, remains to be purchased. Ernest A. Knight is branch manager at Milwaukee.

The Board of Public Works, Manitowoc, Wis., is asking bids until March 3 for furnishing one mounted stone crusher, with half-yard dragline bucket elevator, motor-driven, and an 8-ft. revolving screen. Arthur H. Zander is city clerk.

The Bucyrus Co., South Milwaukee, Wis., will be ready soon for figures on a considerable list of miscellaneous shop equipment for a production addition to its branch works at Evansville, Ind., which is confined to the manufacture of small revolving shovels. W. W. Coleman is president and general manager.

The Bower City Stamping Co., Jamesvile, Wis., has been incorporated with $25,000 capital stock, to manufacture metal stampings, hardware specialties, tools, dies, etc. A building has been leased and is equipped with new and used machinery. The incorporators are A. B. Bergholz, R. A. Cummings and R. L. Conway.

The Petralyke Co., 114 Newberry Street, Appleton, Wis., manufacturer of automobile visors and other specialties from composition board, chemically treated, has decided not to rebuild its factory, damaged by fire several weeks ago, but will relocate in South Milwaukee, Wis. A three-story brick building, partly equipped for chemical products manufacture, has been taken over. Remodeling and retooling is now under way and the factory is to be ready about March 15. The company has increased its capitalization from $50,000 to $150,000. W. H. Fenzlau is president and general manager; William Weimar, vice-president; C. C. Nelson, secretary, and F. J. Amann, treasurer.

The American Grinder Mfg. Co., 148 Broadway, Milwaukee, manufacturer of tool grinders, wrenches, mechanics' tools and other specialties, has effected a reorganization which has provided more adequate working capital and makes possible enlargement of plant and production to meet demands. Herbert P. Brumder, 105 Wells Street, has been elected president; otherwise the personnel remains practically intact.

The Marathon Battery Co., Wausau, Wis., recently incorporated with $150,000 capital, has leased two buildings of the former Mathie Brewing Co. plant in Wausau and is remodeling these for the purpose of manufacturing storage batteries and dry cells for automobile, radio, telephone and telegraph, and similar use. Considerable equipment remains to be purchased. Edgar J. McEachron is chief engineer and works manager.

Froelich Bros. Co., 799-801 Seventh Street, Milwaukee, have plans by R. B. Williamson, architect, 405 Broadway, for a $30,000 garage and service building, 57 x 90 ft., two stories and part basement, at North Avenue and Tenth Street. Work will begin March 15.

The Jenkins Machine Co., Sheboygan, Wis., let the general contract to the Jacob Van Doeselaar Co., local, for a one-story brick and concrete machine shop addition, 35 x 90 ft. It is understood that the annex will be used for the purposes of the Steel Products Co. of Sheboygan, organized a short time ago to take over and develop the automobile bumper business of the Jenkins company, which will concentrate on the production of machinery for automobile body, chair and furniture factories. A. G. Stuedeman is president of both concerns.

Indiana

INDIANAPOLIS, Feb. 18.

WORK is under way on a new plant at Noblesville, Ind., by the New Process Steel Co., to be equipped as a structural steel fabricating works. It is proposed to commence production in one unit in about 60 days, and to construct two additional units to be ready for service in July.

The Sullivan Machinery Co., Michigan City, Ind., is reported to be planning for the installation of a horizontal boring mill.

The Hazleton Light & Power Co., Hazleton, Ind., has been organized to install and operate a power plant and system for local service. Hamilton M. Arthur and Harry B. Scott, both of Hazleton, head of the company.

The Hall-Neal Furnace Co., 1324 North Capitol Avenue, Indianapolis, has filed plans for a one-story addition, 35 x 108 ft., for which a general contract has been let to the Hall Construction Co., Indianapolis.

The Prince Motor Co., 1103 Jackson Street, Michigan City, Ind., has plans for a two-story service and repair shop, 100 x 125 ft., estimated to cost $80,000 including equipment. Nicol, Scholer & Hoffman, Ross Building, Lafayette, Ind., are architects.

A manual training department is under consideration in the new Shortridge high school to be erected at Thirty-fourth and Meridan Streets, Indianapolis, estimated to cost $1,500,000, for which Herbert Foltz, J. F. Wild Building, architect, has just been selected to prepare plans.

The Bluffton Traction Co., Bluffton, Ind., has acquired the plant and system of the Linn Grove Light & Power Co., Linn Grove, and vicinity. Plans are under advisement for extensions and the installation of additional equipment.

The plant of the Burdick Tire & Rubber Co., Noblesville, Ind., which has been idle for a year, will be opened and considerable new equipment will be purchased.

New England

BOSTON, Feb. 18.

THE volume of machine tool business booked the past week was small. Some large local houses did not make a sale, but did a good business in small tools and parts. The redeeming feature of the market is the further accumulation of inquiries, mostly for one, two, three and occasionally four machines. Some of these are large and expensive and in the aggregate there is more prospective business than in a year. Prospects are slow in closing as inquiries in many cases are broadcasted. Machine tool houses consider it necessary to spend much time and money on each inquiry because of competition.

The Holyoke Gas & Electric Co., Holyoke, Mass., will receive bids until Feb. 27 for the erection of a coal pocket. Conveying machinery is required. Plans are private.

Excavation is in progress for a one-story, 88 x 118 ft. power station addition to be erected at Allston, Boston, by the Edison Electric Illuminating Co. of Boston, 39 Boylston Street.

Plans are being drawn for a boiler house 150 ft. in height contemplated by the Narragansett Electric Co., South Street, Providence, R. I. Jenks & Ballou, 10 Weybosset Street, Providence, are the architects.

Equipment for a machine shop for the $8,000,000 generating plant is required by the Montaup Electric Co., Somerset, Mass. Excavation has begun. Stone & Webster, Inc., Boston, are the engineers and general contractors.

Bids will be asked in March for a three-story high school and library to cost $2,500,000 to be erected for Boston on Warren, Townsend and Harrison Streets, Roxbury. The school will contain a machine and woodworking shop. Thomas P. Glynn, School House Department, Boston City Hall, is in charge of the project. Harrison H. Atwood, 61 Alban Street, Dorchester, Boston, is the architect.

Plans are in progress for a factory for the El Paso Cotton Mill Co., Eleventh Street, El Paso, Tex., which involves a one-story, 33 x 46 ft. power plant and a small machine shop. M. H. Merrill Co., 50 State Street, Boston, are the engineers.

Work has been started on a seven-story addition to the Russell & Erwin plant, American Hardware Corporation, New Britain, Conn.

The Wood Hydraulic Hoist & Body Co., Detroit, has purchased property on North Beacon Street, Brighton, Boston, on which it is proposed to erect a group of plant units within the next year.

The United States Army Department, Washington, constructing quartermaster in charge, has authorized the installation of a steam boiler and auxiliary equipment at Fort Ethan Allen, Vt., for which bids will soon be asked.

Smith & Walker, 80 Boylston Street, Boston, architects, are preparing plans for a two-story machine shop, 50 x 150 ft., at Peabody, Mass., for which the owner's name will be announced later.

The Hood Rubber Co., Watertown, Mass., manufacturer of automobile tires and other products, is arranging for a preferred stock issue of $1,600,000, a large part of the proceeds to be used for extensions and the installation of additional equipment.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids until Feb. 26 for 1700 lb. of welding rods, and 8000 lb. of electrodes, for the Boston Navy Yard, schedule 1896.

C. A. Pendleton, 13 Washington Street, Brookline, Mass., operating a machine shop, plans the installation of a power-operated key-making machine.

The Barbour-Stockwell Co., 205 Broadway, Cambridge, Mass., manufacturer of buckets, railroad supplies, etc., has foundations in progress for a one-story plant at Clark and Market Streets, 140 x 142 ft., to cost $20,000 exclusive of equipment, for which a general contract recently was awarded to the W. Fillmore Co., 25 Cherry Street.

Ovens, power equipment, conveying and other machinery will be installed in the proposed plant to be erected by the General Baking Co., 342 Madison Avenue, New York, at New Haven, Conn., for which plans are being prepared by Francisco & Jacobus, 511 Fifth Avenue, New York.

Fire, Feb. 14, destroyed a portion of the plant of the Clapp Rubber Co., Hanover Four Corners, Hanover, Mass., with loss estimated at $200,000 including equipment and stock. It is planned to rebuild.

The New England Fuel & Transportation Co., 111 Devonshire Street, Boston, is reported to be planning to purchase conveying equipment for its new coke screening works at Everett, Mass.

E. A. Gillett & Sons, 286 Rutherford Avenue, Charlestown, Mass., manufacturers of carriages, bodies, etc., have construction in progress on a new plant, 115 x 165 ft., at Everett, Mass., for which the William T. Reed Co., 200 Devonshire Street, Boston, has the general contract.

The Tuttle Brick Co., Middletown, Conn., has awarded a general contract to Thomas Sellew, Cromwell, Conn., for a one-story addition to the machine department at its plant at Newfield, Conn., 45 x 78 ft. Additional pressing and other machinery will be installed.

South Atlantic States

BALTIMORE, Feb. 18.

THE Lamond Brick & Tile Co., Clarendon, Va., recently organized with a capital of $150,000, has plans for the construction of a new plant on the Potomac River, near Alexandria, Va., with power house, estimated to cost $90,000 including equipment. C. C. Lamond is president, and Agnus W. Lamond, secretary, both of Clarendon.

The Security Lime & Cement Co., Hagerstown, Md., is reported to be planning for extensions at its plant at Security, Md., and the installation of additional equipment. The company recently increased its capital from $800,000 to $1,200,000.

The Peninsular Brick Co., Salisbury, Md., has inquiries out for a 75- or 100-lb. fuel oil engine, new or used; a 20 x 10 in. air compressor, belt-driven, with auxiliary equipment; a steel oil storage tank, 10,000 to 20,000 gal. capacity, with steam coils, and about 24 tons of 16-lb. relay rails and splices.

The Bureau of Foreign and Domestic Commerce, Washington, has information regarding a company at Antwerp, Belgium, in the market for machinery for a sugar refinery, including cranes, conveyors and pneumatic-packing equipment, reference No. 9125; of a concern at Penang, Straits Settlements, desirous of purchasing ice-making and refrigerating machinery, reference No. 9128; of a company at Algiers, in the market for machinery to manufacture wooden barrels, reference No. 9126; a company at Rio de Janeiro, Brazil, desirous of purchasing pulverized coal-burning equipment, reference No. 9090; a concern at Sosnowiec, Poland, in the market for milling machinery and grain elevator equipment, reference No. 9107; a concern at Limerick, Ireland, for galvanized barbed wire and wire nails, reference No. 9141; a company at Mullingar, Ireland, for hand and cross-cut saws, axes, etc., reference No. 9139.

W. F. Lemon, 2310 Connecticut Avenue, N. W., Washington, has plans for a two-story automobile service and repair building, 85 x 105 ft., at 2329 Champlain Street, to cost $85,000 with equipment. C. N. Norton, 817 Fourteenth Street, N. W., is architect.

Thomas Charles Williams, 8 East Lexington Street, Baltimore, has inquiries out for an air compressor, with gasoline engine, small size.

Dr. S. S. Hutchinson, Bladenboro, N. C., is making inquiries for lathes and other woodworking equipment for installation in a local plant.

The United States Army Department, Washington, constructing quartermaster in charge, has approved the installation of two boilers and auxiliary equipment at the Washington Barracks; improvements and repairs to the refrigerating plant at Fort Benning, Ga., and the installation of a wagon scales at this location; installation of coal-unloading equipment at Forts Strong and Andrews, Mass.; oil engines for a pumping plant at Fort McKinley; installation of a pumping plant at the Bolling Field, D. C.; oil-burning equipment at Fort Sam Houston, Tex.; track scales at Fort Bragg, N. C.; new boilers at Fort Riley, Kan., and oil-burning equipment at the Jefferson Barracks, Mo. Specifications will be prepared and bids soon asked.

The Greene County Creamery, Inc., Standardsville, Va., is in the market for a 10 hp. engine; 12 hp. return tubular boiler; double beam, 600-lb. capacity platform scales.

The Common Council, Vass, N. C., plans the installation of electric-pumping machinery in connection with a proposed waterworks. The J. B. McCrary, Atlanta, Ga., is engineer.

The Common Council, Preston, Md., plans for the installation of electric pumping equipment in connection with a waterworks system.

The Bureau of Foreign and Domestic Commerce, Washington, has information regarding a company in Honduras which is receiving a concession from the state officials at Tegucigalpa for the construction and operation of a hydro-electric power plant, the installation to include two water turbines, direct-connected generator and auxiliary equipment, reference No. 119,489.

The School Board, Durham, N. C., has rejected bids for the construction of the proposed junior high school to cost $200,000, with manual training department, and will hold the project in abeyance for about six months. Milburn, Heister & Co., Union Savings Bank Building, Washington, are architects.

The Edgerton Concrete Products Co., 202 Planters' Bank Building, Wilson, N. C., is in the market for mechanical unloading equipment to handle sand from cars to overhead bins, with capacity of about 8 cars per day.

Manual training equipment will be installed in the new consolidated high school to be erected by the Rutherfordton County Board of Education, Rutherfordton, N. C., to cost $200,000, for which bonds have been approved. Plans will soon be drawn.

The Atlantic Coast Lumber Corporation, Georgetown, S. C., has inquiries out for coal hoisting and handling machinery.

The Roman Steel Tennis Net Co., Cumberland, Md., recently organized, has leased a building on Frederick Street for a new plant to manufacture steel nets and kindred products. J. Philip Roman is head.

The Gretna Roller Mills, Gretna, Va., have inquiries out for a 100 hp. generator and auxiliary equipment.

Gulf States

BIRMINGHAM, Feb. 18.

WORK has begun on a new plant at Bessemer, Ala., for the Bessemer Galvanizing Works, Inc., with headquarters at Birmingham, for zinc galvanizing of structural steel shapes and other steel products. It is proposed to have the plant ready for service in from 30 to 60 days.

The Central Foundry Co., Anniston, Ala., is arranging to rebuild the portion of its plant destroyed by fire Feb. 7, with loss estimated at $100,000 including equipment. E. P. Cooper is manager

The Pahokee Utilities Co., Pahokee, Fla., recently organized, is planning for the construction of an electric power house. An ice-manufacturing plant will also be erected. D. S. Spooner is president, and J. H. Cason, secretary and treasurer, both of Pahokee.

The International Harvester Co., 606 South Michigan Avenue, Chicago, is said to have completed negotiations for the acquisition of the building at New Orleans heretofore occupied by the New Orleans Corrugated Fiber Box Co. It is proposed to use the structure for a factory branch for agricultural and tractor equipment, with the installation of complete service and repair facilities. The building approximates 85,000 sq. ft. of floor space.

The Chester Carbon Co., Monroe, La., is planning the installation of a gasoline refinery in connection with two plants for the production of carbon black, now in course of erection, estimated to cost $500,000 with machinery.

Fire, Feb. 6, destroyed a portion of the plant of the Victory Oil Co., St. Bernard Parish, near New Orleans, with loss estimated at $100,000 including equipment. It is planned to rebuild.

The Florida Co-operative Machinery Works, Inc., Tampa, Fla., is contemplating the construction of a new plant in the vicinity of Birmingham, removing the equipment now at Tampa Works and installing additional apparatus. The company specializes in the manufacture of agricultural machinery, automobile lamps and kindred products.

The Pauline Oil & Gas Co., Oklahoma City, Okla., has plans for the construction of an oil refinery at Panhandle City, Tex., where site has been acquired It is now operating a refinery at Duncan, Okla., and plans the removal of this unit to Panhandle City, installing additional machinery.

The construction of a pipe line, with pumping stations, is also under consideration, for crude oil supply for the new refinery, which will cost $100,000.

Manual training equipment will be installed in the three-story high school to be erected at Lamesa, Tex., estimated to cost $125,000, for which bonds have been voted. Peters & Haynes, Lubbock, Tex., are architects.

The Alabama Water Co., Bessemer, Ala., is considering the installation of electric-operated pumping machinery in connection with extensions and improvements in its system, estmated to cost $200,000.

The L. Wolff Mfg. Co. of Texas, Dallas, Tex., affiliated with the company of the same name with headquarters at Chicago, manufacturer of plumbing equipment and supplies, has acquired the Warden Supply Co., La France Street and Pacific Avenue, Dallas, operating a similar business, for $100,000. The purchasing company will merge the Warden organization, and plans for general expansion, with increase in capital to $300,000.

The Southwestern Gas & Electric Co., Shreveport, La., is arranging a fund of about $1,500,000 for extensions and improvements in plants and system during the year.

The Southern Railway Co., Birmingham, will soon break ground for a one-story locomotive erecting shop and one-story car repair shop at North Birmingham, for which plans have been completed by Dwight P. Robinson & Co., Inc., 125 East Forty-sixth Street, New York, engineer.

The Florida East Coast Railway Co., St. Augustine, Fla., has selected a site at Bowden, Fla., for the erection of new locomotive repair works to replace the existing shops at South Jacksonville, Fla. W. G. Brown is engineer.

The Common Council, Coconut Grove, Fla., is considering the installation of electric-operated pumping machinery in connection with its proposed municipal waterworks estimated to cost $200,000.

The Martindale Motor Corporation, Martindale, Tex., will commence the construction of a two-story service and repair building, 70 x 85 ft., to cost about $32,000.

The Ocklawaha Reclamation Farms, Ocala, Fla., will construct and operate a hydroelectric power plant at the Government dam on the Ocklawaha River, Marion County, on which work will soon commence.

The Alabama Power Co., Sheffield, Ala., plans erection of a high power transmission line from Sheffield to Huntsville, Ala., and will require transformers, motors, substation equipment, etc.

Contract has been awarded by the Hughes Tool Co., Houston, Tex., for an aluminum finished steel foundry, 80 x 120 ft. About $52,000 worth of equipment will be installed, to include a 5-ton electric crane and an electric melting furnace.

Pacific Coast

SAN FRANCISCO, Feb. 18.

A TRACT of 2½ acres in the Fawkes industrial section, Burbank, Cal., has been acquired by the Clark-Turner Piston Co., Los Angeles, for the initial unit of a new plant, 50 x 230 ft., for which a general contract has been awarded to the Austin Co., Bartlett Building, Los Angeles. The works will replace the company's plant at Los Angeles, recently destroyed by fire.

The Feather River Power Co., Oroville, Cal., affiliated with the Yuba River Power Co., is arranging a fund of $10,000,000 for extensions during the year, to include the construction of two hydroelectric generating plants with capacity of 30,000 hp., and three power dams, located on Grizzily Creek, Ament Creek and Gold Lake, respectively. Lars Jorgensen, Hobart Building, San Francisco, is engineer.

The Marchant Calculating Machine Co., Powell and Landregan Streets, Los Angeles, has plans for a new one-story foundry estimated to cost $55,000. It is said that a 10-ton electric traveling crane will be installed in connection with general foundry equipment.

The Portland Railway, Light & Power Co., Portland, Ore., has preliminary plans for a hydroelectric generating plant on the Clackamas River, with ultimate capacity of 100,000 hp., estimated to cost $12,000,000 with transmission system.

The Columbia Ice & Cold Storage Co., Wenatchee, Wash., will build an addition to its ice-manufacturing plant No. 2, to cost about $100,000 including equipment.

The Aluminum Cooking Utensil Co., New Kensington, Pa., is arranging for the purchase of property at Forty-sixth and Adeline Streets, San Francisco, for the erection of a one and two-story factory branch and distributing plant, totaling about 60,000 sq. ft. District offices are in the Monadnock Building, San Francisco, with E. T. Grove, district manager.

The H. J. Heinz Co., 1062 Progress Street, Pittsburgh, plans the construction of a power house and machine shop at its proposed branch plant at Oakland, Cal., where site has been secured. The entire works will cost about $800,000 including machinery.

J. M. Perry & Co., Yakima, Wash., will build a one-story addition to its cold storage plant, 60 x 80 ft., estimated to cost $37,000 with equipment.

The Crystal Ice & Cold Storage Co., Phoenix, Ariz., will commence the erection of a new four-story cold storage plant, 40 x 55 ft., to cost $25,000 exclusive of machinery. Lescher & Mahoney, Bank of Arizona Building, are architects.

The Union Oil Associates, Los Angeles, affiliated with the Union Oil Co., Union Oil Building, are planning for an increase in capital from $30,000,000 to $75,000,000, a portion of the proceeds to be used for extensions in refineries and other properties.

Th Los Angeles Spring Bed Co., Los Angeles, has awarded a general contract to the Austin Co., Bartlett Building, for a one-story plant, 50 x 100 ft., for which foundations will be laid at once.

The Columbia Lumber Co., St. Helens, Ore., is planning for an addition to its local lumber mill, 50 x 200 ft., with electrically-operated equipment to provide for an output of 80,000 ft. per day.

The Western Pacific Railroad Co., Mills Building, San Francisco, has arranged an appropriation of $6,000,000 for extensions, equipment, etc., during the present year, the work to include extensions in locomotive and car repair shops in California and Nevada. J. W. Williams is chief engineer.

Work will commence on the new one-story plant on Olive Avenue, Burbank, Cal., 50 x 230 ft., for the Turner Piston Co., Los Angeles, for which a general contract has been let to the Austin Co., Bartlett Building.

The Hanford Union High School District, Hanford, Cal., G. W. Armstead, clerk, has plans for one-story vocational and machine shops at the high school building. Coates & Travers, Rowell Building, Fresno, Cal., are architects.

The Home Sash & Mfg. Co., Spokane, Wash., will commence the erection of the first unit of a new factory, 65 x 192 ft., estimated to cost $80,000 with equipment. A power house is planned. Other units will be built later.

The Union Oil Co., San Diego, Cal., is arranging for an addition to its oil storage and distributing plant with equipment, estimated to cost $90,000. L. H. Fish is district manager.

The Cain Gas Radiator Co., 5215 Moneta Avenue, Los Angeles, has plans for a new one-story factory, 80 x 200 ft., to cost approximately $40,000 with equipment.

The Williams Fir Finish Co., 2025 Fifteenth Avenue, Seattle, will commence the erection of a new planing mill and lumber plant to cost $35,000 with equipment.

The NO-Shift Gear Co., Los Angeles, Cal., incorporated with capital stock of $100,000, will manufacture transmission gears, but has not determined how operations will be conducted. It is in the market for gear-cutting machines. F. L. Norton, 1928 Carmen Avenue, is president.

Canada

TORONTO, Feb. 18.

DURING the past month a definite improvement has made its appearance in the machine-tool market. Inquiries are being received from a wide range of buyers and orders have been placed by practically all classes of industry. A brisk demand for all lines of equipment is expected for several months.

The F. Wallace & Sons Mfg. Co. is establishing a plant at Cookshire, Que., for the manufacture of cutlery.

Guay, Savoie & Cie, Plessisville, Que., are in the market for foundry equipment, including lathes, molds, presses, etc.

The Canada Wood Specialty Co., Orillia, Ont., is building an $80,000 addition to its plant and is in the market for sawmill and woodworking equipment. W. D. Mott is manager.

C. E. Fraser, township engineer, 1361 Kingston Road, Toronto, will purchase equipment for a gravel screening and crushing plant.

It is reported that the plants of the Machine Agricole Nationale, Montmagny, Que., which have been closed for some time, will resume operations in the near future for the production of farm implements, etc.

The Montreal Power Consolidated, Montreal, plans to develop 100,000 hp. at the Lachine Rapids. The Lachine Rapids Hydraulic & Land Co., a subsidiary, has been closed for some time owing to the unsatisfactory amount of power

developed, but it is understood that the parent company is preparing to completely remodel and modernize the equipment.

The Ford-Smith Machine Co., Hamilton, Ont., is in the market for a second-hand oil tempering furnace, similar to No. 30 American Gas Furnace Co.'s oil tempering furnace.

The town of Bagotville, Que., contemplates the construction of a dam on the Riviere Mars, with the view of erecting a power development plant.

The Hull Electric Co., Hull, Que., will erect a power development plant at Paugan Falls in Denholm Township next spring, to have an ultimate capacity of 100,000 hp. W. J. Francis & Co., Montreal, are consulting engineers.

The Midland Elevator Co., Midland, Ont., will start work early in the spring on the erection of a grain elevator to cost $400,000.

The American La France Engine Co. of Canada, 195 Weston Road, Toronto, will build an addition to its plant.

The Seaman-Kent Co., Ltd., Toronto, has awarded contracts for the erection of a woodworking factory at Renfrew, Ont., to cost $150,000.

The Toronto Hardware Mfg. Co., 402 Dufferin Street, Toronto, has started work on additions and alterations to its factory to cost $50,000.

Tavistock Milling Co., Tavistock, Ont., is asking for equipment for a proposed $90,000 flour mill.

The Nipigon Corporation, Port Arthur, Ont., will buy equipment for a pulp and paper mill. C. W. G. Gibson, 80 Homewood Avenue, Hamilton, Ont., is purchasing agent.

The plant of the Oxford Foundry Co., Oxford, N. S., was totally destroyed by fire with a loss of $40,000.

The Barnett-McQueen Co., Fort William, Ont., has received the contract for a terminal grain storage plant for the Mutual Elevator Co., at Port Arthur, Ont., to cost $1,000,000.

The Montreal plant of the Canada Metal Co., Toronto, was destroyed by fire with a loss of $30,000.

The Niagara Falls Paper Co., Toronto, proposes to start work during the next six months on a pulp and paper mill at Merritton, Ont.

Excavation work and the pouring of concrete is underway at Hemming's Falls, Que., on a power development dam to cost $1,500,000 for the Southern Canada Power Co., Montreal. The main construction work will not be started until the end of March. The Foundation Co., Montreal, has the general contract.

Remodelling of a building on Welland Avenue, Niagara Falls, Ont., is proposed for the use of the United States Light & Heat Co., whose plant was recently destroyed by fire. Mr. Kincaid, care of the company, Niagara Falls, N. Y., is in charge of the work.

Work is under way in connection with the large foundry at Hamilton, Ont., for the Canadian Westinghouse Co., Ltd. It will be approximately 500 ft. long. Bernard H. Prack, Hamilton, is the architect and the structural contracts have been awarded. It is understood there is still some equipment to be purchased.

The Albany Perforated Wrapping Paper Co., Albany, N. Y., has secured 60,000 acres of timberland at Sheet Harbor, N. S., where it will erect a pulp mill at a cost of $250,000. Construction will start May 1.

Western Canada

Construction work will be started this spring on a cement plant at Popkum, near Chilliwack, B. C., for the Mainland Portland Cement Co. Chicago capital is behind the undertaking. W. J. Budd, managing director of the company stated that all preliminary work has been completed and the work of erecting the plant will be rushed to completion after March 1.

The Shimoisaka Timber Co., Ltd., South Vancouver, B. C., will start work at once on the erection of a sawmill at the foot of Doman Road to cost $200,000.

The Panama Pacific Grain Terminals, Regina, Sask., will purchase complete flour mill equipment. J. H. Newson, Lumsden, Sask., is a director.

The Reliance Oils of Canada, Edmonton, Alta., is receiving prices on producing, storing, distributing and manufacturing equipment for petroleum and carbon oils.

The Edward A. Moss Co., contractor and erector, announces the removal of offices to 1303 Union Trust Building, East Ninth and Euclid Avenue, Cleveland.

The J. B. Engineering Sales Co., Connecticut representative for the Conveyors Corporation of America, 326 West Madison Street, Chicago, has moved its offices from Hartford, Conn., to the Chamber of Commerce Building, New Haven, Conn.

Plans of New Companies

The Mutable Mfg. & Sales Co., 127 West Washington Street, Chicago, has been organized with $500,000 capital stock, under Delaware laws, to manufacture metal toys. Plans provide for the construction of a factory 175 x 250 ft., at or near Gary, Ind. Part of the work will be done by contract. Wood-working lathes and a few light drilling machines will be required. Charles E. Dobbins, president C. E. Dobbins & Co., is president.

The City Foundry Co., Hartford, Conn., recently organized with authorized capital stock of $50,000, will manufacture and deal in castings of all kinds. It plans to start business on a moderate scale. Clifford A. Belanger, 8 Jencks Street, East Hartford, and Wallace M. Wright, Rosemary Street, West Hartford, head the organization.

The Special Machinery Co., Bridgeport, Conn., recently organized with capital stock of $50,000, will manufacture machinery and metal goods. John B. Murphy, Harry J. Walsh, L. Murphy and S. E. Walsh are the principal stockholders.

The Standard Tank Car Co., recently organized at Sharon, Pa., is a reorganization of the former company by that name, and J. Bruce Orr of Pittsburgh has been made president to succeed John Stevenson, Jr. The new organization has taken over the plant of the old. John Stevenson, director and treasurer; Daniel Stevenson, director and vice-president, and E. A. McDonald, director and secretary, will retire in favor of members of the new organization. The new board of directors includes L. F. Payne, representing the Carnegie Steel Co.; R. F. Holmes of the Westinghouse Air Brake Co.; William Robinson, Pittsburgh; H. C. Rorick, Toledo, Ohio; E. Clarence Miller, Philadelphia and J. P. Whitla, Sharon.

The No-Shift Gear Co., Los Angeles, Cal., has been organized with $100,000 capital stock to manufacture gears for power transmission without the necessity of shifting. Manufacturing will be done by contract, but as soon as a plant has been purchased or leased, the company will require gear-cutting machines. The officers of the company are: F. L. Norton, 1928 Carmen Avenue, president; C. H. Braden, secretary-treasurer, and P. D. Smith, vice-president.

The Pacific Blow Pipe Co., care of Middleton & Middleton, Yeom Building, Portland, Ore., has been organized to manufacture blow piping and kindred products. It is identified with a company which has been active in this line.

Adroit Tool Co., 14 Front Street, New York, has been incorporated with $24,000 capital stock to manufacture tools and radio devices. It has a small shop, now in production on soldering irons, but plans to expand its line to include other tools and radio equipment. In this connection it is looking for a building ready for occupation. Ernest Young heads the company.

Brown-Bennett & Co., 30 Church Street, New York, have been organized to deal in new and used machinery and metal products. Theodore Brown and Frederick A. Bennett are the principals.

Deline & Elmes, recently established at 25 Church Street, New York, as representative for the National Hoisting Engine Co., are planning to represent a crane manufacturer in the metropolitan district and are desirous of hearing from concerns interested in such a connection.

The Metal Tube Mfg. Co., 723 Fulton Street, Chicago, has been incorporated to manufacture brass, copper and steel tubing, drawn products, tools and special machinery Charles M. Sperry is president.

The Storms-Harvey Equipment Co., 30 Church Street, New York, has been organized to deal in tanks and chemical equipment. The company will design tanks and specify for manufacturing on the outside. Edwin Storms heads the company.

The Perfect Razor Blade Stropper Co. has been incorporated with $50,000 capital stock to manufacture razor stropping devices. Immediate manufacturing will be done through contract, but some time later the company may do its own manufacturing. It will be in the market for small steel boxes when the organization is in full swing. Dies are being made. George E. Cunningham, Utica, N. Y., is president; William A. Nelson, Cambridge, Mass., vice-president, and George I. Honey, 21 Madison Avenue, Montclair, N. J., treasurer.

The Pitt Construction Co., Fulton Building, Pittsburgh, was low bidder on the contract for improvements to the water system of McKeesport, Pa., which will include new boilers, additional filter beds and a standpipe.

The United Metal Products Co., Battle Creek, Mich., has been organized with capital stock of $1,000,000 to acquire the business of the United Steel & Wire Co., that city, which has been in operation for 12 years. No expansion is contemplated at present. Upon completion of transfer of assets, the new company will assume the name of the acquired company. George J. Denebach is president.

The Hudson Electric Plating & Radiator Co., New York, has been incorporated with capital stock of $24,000 to operate a general metal and plating works. Method of manufacturing has not yet been decided upon but plans will be perfected within a few weeks. Temporary address is in care of Philip Ordover, 41 East Forty-second Street.

A. G. Richter, Inc., 411 East Twenty-second Street, New York, has been incorporated with $25,000 capital stock to operate a structural iron works, continuing a business established for nearly 40 years in the manufacture of structural and ornamental iron. Incorporators are A. G. and K. E. Richter.

Youngs, MacEwan & Schier, 284 Merrick Avenue, Rockville Center, L. I., has been incorporated with capital stock of $15,000 to act as distributor of oil burning equipment. F. T. Youngs, Jr., W. Schier and J. R. MacEwan are the principals.

General Electric Co. Moves District Sales Office from Cincinnati to Cleveland

The General Electric Co. moved its Cleveland sales offices from the Illuminating Building to the Union Trust Building Feb. 15, and on March 1 will move its Central Eastern district sales office from Cincinnati to Cleveland. The sales district comprises nearly all of Ohio, two-thirds of Indiana, and all of Kentucky and Tennessee. The Cleveland office has been a local office under the Cincinnati headquarters and W. J. Hanley, for 10 years the district sales manager, has been dividing his time between the two offices. The Cincinnati office will hereafter be a local office under the district office in Cleveland. The change has necessitated a large increase in floor space and the company has taken over 15,000 sq. ft. of space in its new location.

The General Electric Co. will also open a warehouse in Cleveland. This will be located in the first floor of the Pitney Glass Works of the National Lamp Works on East 152nd Street and will occupy over 35,000 sq. ft. of floor space. The Cincinnati warehouse will be continued. In addition the company will equip service shops in connection with its Cleveland and Cincinnati warehouses each with 12,000 sq. ft. of floor space. These will be equipped with electric traveling cranes and machinery for repair and assembling work.

The removal of the district sales office to Cleveland has resulted in a number of changes and transfers in the sales organization. L. T. Rainey, formerly district manager of the power and mining department in Cincinnati, has become manager of the Cincinnati office and has been succeeded by L. U. Murray, who has been manager of the local sales office in Columbus. Mr. Murray will have the title of district industrial department manager, a change having been made in the name of this department. A. J. Davies will succeed Mr. Murray in the Columbus office. P. Worth, who has been manager of the supply department in Cincinnati, has been appointed district manager of the central station department with headquarters in Cleveland. H. N. St. Clair will be district manager of the Edison Incandescent Lamp department. W. S. Culver, district engineer, and F. V. Gantt, manager of the railway department, will move their offices from Cincinnati to Cleveland.

Seneca Falls Mfg. Co. Sold

The Seneca Falls Mfg. Co., Seneca Falls, N. Y., manufacturer of "Star" engine lathes and "Star" short-cut production lathes, has been sold to the interests which own the Fitchburg Machine Works, Fitchburg, Mass., manufacturer of the "LoSwing" lathe. The new owners of the Seneca Falls plant are familiar with the manufacturer of "Star" lathes, it is stated, through having owned and operated the plant in 1917, 1918 and 1919.

E. R. Smith, vice-president Fitchburg Machine Works, general manager of the Seneca Falls Mfg. Co. until 1920, again becomes general manager of the Seneca Falls company. For the time being activities of the latter company will be confined to "Star" lathes, but later on other lines of machine tools will be added.

It is not expected that any new equipment will be needed for the Seneca Falls plant, but as stocks of materials are pretty well depleted, there will be replenishment in that direction.

STEEL AND INDUSTRIAL STOCKS

The range in prices of active steel and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalmers ..	46	48¾	Jones & L'hlin pf.	110¼	110½
Allis-Chal. pf...	93⅞	94¾	Lima Loco.	64¼	68⅝
Am. B. S. & Fdy.	78	79	Midvale Steel....	32½	32½
Am. Can 112½		120⅝	Nat.-Acme	8½	8¾
Am. Can pf.....112		112½	Nat. En. & Stm..	32½	38¾
Am. Car & Fdy..165		171	N. Y. Air Brake	39⅛	41¾
Am. Locomotive. 71½		75½	Otis Steel	10¼	11⅜
Am. Loco. pf....119		119	Otis Steel pf....	65	67½
Am. Radiator ..101		103¾	Pressed Steel Car	54	56½
Am. Steel Fdries.	37½	40⅛	Pressed Steel pf.	89⅞	90
Am. Stl. Fd. pf..103½		103½	Replogle Steel ..	11⅛	12⅝
Bald. Loco. 120½		129⅝	Republic	54¼	61⅞
Beth. Steel	55⅝	61⅜	Republic pf.	93	94
Beth. Stl. 7% pf.	96	97	Sloss-Sheffield ..	59	67¼
Beth. Stl. 8% pf.110¼		110⅝	Sloss-Shef. pf....	87	87½
Br. Em. Stl. 1 pf.	53	53	Steel of Canada.	76	78½
Br. Em. Stl. 2 pf.	15⅝	15⅝	Superior Steel ..	34	34¼
Chic. Pneu. Tool	82½	82½	Transue-Wms. ..	33	33¼
Colo. Fuel	24⅞	28	Un. Alloy Steel..	32⅝	37
Crucible Steel ..	62¼	70½	U. S. Pipe.....	68	73½
Crucible Stl. pf..	92	92	U. S. Pipe pf...	85	86¾
Deere pf.	72	73	U. S. Steel.....103¼		108¾
Gen. Electric ...208		218½	U. S. Steel pf...119¼		119⅝
Gt. No. Ore Cert.	29	30½	Vanadium Steel..	29⅝	33½
Gulf States Steel	79¼	88¼	W'house Air Br.	91½	95½
Inland	35⅝	37⅝	Y'gstown S. & T.	69⅛	69¼
Int. Har.	82½	85½			

Industrial Finance

During 1923 the ship repair business of the Bethlehem Shipbuilding Corporation, Ltd., showed an increase over 1922 of 22 per cent in number of ships repaired. Total tonnage repaired was 22,427,000 tons, representing 5556 ships. The corporation is a subsidiary of the Bethlehem Steel Corporation, handling shipbuilding and ship repair work of the parent corporation, in addition to constructing passenger railroad cars, Diesel engines and special machinery for shipping and industrial purposes. "Shipbuilding has declined throughout the world in the past few years," President Grace said in a public statement. "According to a recent statement by Lloyd's Register, world ship construction for last year less than a quarter of that for the record year 1919, when 7,144,000 gross tons of merchant shipping was sent down the ways." During 1923 the company constructed 25 steel vessels of 45,854 gross tons, of which 15 were for commercial uses. On Jan. 1, 1924, there were under construction 14 steel ships of 17,500 gross tons.

The Baldwin Locomotive Works reports net profits for 1923, after all expenditures and reserves, of $3,716,464, compared with $5,206,519 in 1922. Total sales last year reached $102,762,075 against $33,087,350, and manufacturing profit $10,184,755 against $1,994,362 in the previous year. After charges and preferred dividends for 1923 there remained $25.58 per share on common stock. This is the highest rate of earnings since 1918. The Baldwin works has established a reserve of $2,800,000 for 1924 dividends, thereby fixing its stock at a definite 7 per cent basis.

Net earnings of the Truscon Steel Co., Youngstown, Ohio, in 1923 were $1,536,356 and after payment of common and preferred stock dividends there remained a surplus of $949,-101. Total surplus at the end of the year was $2,254,476. The company in 1923 did a gross business of $22,105,000.

Bids will be received until March 17 on the property of the Climber Motor Corporation, maker of automobiles and trucks, Little Rock, Ark., which has been ordered to be sold by the court.

Albert S. Cook, president Asa S. Cook Co., maker of automatic machinery, West Hartford, Conn., has taken action against the Cook company in the Superior Court of Hartford County. Lucius C. Ryce of Fitzwilliam, N. H., was appointed temporary receiver and has taken possession of about $265,000 worth of assets. The action resulted from the failure of stockholders to agree upon a plan for new capital. Reorganization is the object.

The Virginia Iron, Coal & Coke Co. reports gross earnings for 1923 of $7,918,766 against $4,354,846 in the preceding year. Net income, after all expenses and charges, totaled $456,664 against $575,393 in 1922. After dividends there appeared a deficit of $143,146, against a surplus in 1922 of $325,583.

The J. G. Brill Co. reports net profits of $2,146,505 for 1923, equivalent to $37.95 per share on $4,810,200 common stock outstanding, after deducting expenses, depreciation, taxes, etc., and allowing for preferred dividends, as compared with net profits of $954,968 in the preceding year. Total sales last year amounted to $18,167,486 as compared with $10,177,582 in 1922. Surplus for the year came to $1,585,-395 as compared with $634,368 in the preceding year.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates

	Per Lb.
Bars:	
Refined iron bars, base price	3.54c.
Swedish charcoal iron bars, base	7.00c. to 7.25c.
Soft steel bars, base price	3.54c.
Hoops, base price	5.19c.
Bands, base price	4.39c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger base	3.64c.
Channels, angles and tees under 3 in. x ¼ in., base	3.54c.
Steel plates, ¼ in. and heavier	3.64c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.60c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	4.10c.
Toe-calk, ½ x ⅜ in. and larger	4.60c.
Cold-rolled strip, soft and quarter hard	7.50c. to 8.50c.
Open-hearth, spring steel	4.50c. to 7.50c.
Shafting and Screw Stock:	
Rounds	4.40c.
Squares, flats and hex	4.90c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High-speed steel, 18 per cent tungsten	75c. to 80c.

Sheets

Blue Annealed

	Per Lb.
No. 10	4.34c.
No. 12	4.39c.
No. 14	4.44c.
No. 16	4.54c.

Box Annealed—Black

	Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.55c. to 4.60c.	.....
Nos. 22 and 24	4.70c. to 4.75c.	5.10c.
No. 26	4.75c. to 4.80c.	5.15c.
No. 28*	4.85c. to 4.90c.	5.25c.
No. 30	5.05c. to 5.10c.	.....

Galvanized

	Per Lb.
No. 14	4.95c. to 5.00c.
No. 16	5.10c. to 5.15c.
Nos. 18 and 20	5.25c. to 5.30c.
Nos. 22 and 24	5.40c. to 5.45c.
No. 26	5.55c. to 5.60c.
No. 28*	5.85c. to 5.90c.
No. 30	6.30c. to 6.35c.

*No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel Black	Galv.	*Wrought Iron* Black	Galv.
½ in. Butt	—41	—24	½ in. Butt	— 4	+19
¾ in. Butt	—46	—32	¾ in. Butt	—11	+ 9
1-3 in. Butt	—48	—34	1-1½ in. Butt	—11	+ 6
2½-6 in. Lap	—44	—30	2 in. Lap	— 5	+14
7-8 in. Lap	—41	—11	2½-6 in. Lap	— 9	+ 9
9-12 in. Lap	—34	— 6	7-12 in. Lap	— 3	+16

Bolts and Screws

Machine bolts, cut thread, 45 and 10 to 50 and 10 per cent off list

Carriage bolts, cut thread, 35 to 35 and 10 per cent off list

Coach screws.....45 to 50 and 10 per cent off list

Wood screws, flat head iron, 75, 20, 10 and 7½ per cent off list

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	4.75c. to 5.00c.
Annealed soft	4.75c. to 5.00c.
Galvanized annealed	5.40c. to 5.65c.
Coppered basic	5.40c. to 5.65c.
Tinned soft Bessemer	6.40c. to 6.65c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	17¾c. to 18¾c.
High brass wire	18¼c. to 19¼c.
Brass rods	15½c. to 16½c.
Brass tube brazed	25¾c. to 27¼c.
Brass tube, seamless	22 c. to 23 c.
Copper tube, seamless	23 c. to 24 c.

Copper Sheets

Sheet copper, hot rolled, 20½c. to 21c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	Coke—14 x 20 Prime	Seconds
		80 lb.	$6.55	$6.30
		90 lb.	6.65	6.40
		100 lb.	6.75	6.50
IC	$12.55	$10.70	IC	7.00	6.75
IX	13.95	12.55	IX	8.25	8.00
IXX	15.55	13.75	IXX	9.50	9.25
IXXX	17.10	15.30	IXXX	10.75	10.50
IXXXX	18.85	16.80	IXXXX	12.00	10.75

Terne Plates

8 lb. coating, 14 x 20

100 lb.	$7.00 to $8.00
IC	7.25 to 8.25
IX	8.25 to 8.75
Fire door stock	9.00 to 10.00

Tin

Straits pig	60c.
Bar	68c. to 70c.

Copper

Lake ingot	15½c.
Electrolytic	15 c.
Casting	14 c.

Spelter and Sheet Zinc

Western spelter	7¾c.
Sheet zinc, No. 9 base, casks	10¾c. open 11½c.

Lead and Solder*

American pig lead	9½c. to 9¾c.
Bar lead	12c. to 13c.
Solder ½ and ½ guaranteed	39c.
No. 1 solder	37c.
Refined solder	33c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c. to 90c.
Commercial grade, per lb	35c. to 50c.
Grade D, per lb.	25c. to 35c.

Antimony

Asiatic	12½c. to 13c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	36c.

Old Metals

Business is active and values are higher. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	11.25
Copper, heavy wire	10.50
Copper, light bottoms	9.00
Brass, heavy	6.25
Brass, light	5.00
Heavy machine composition	8.50
No. 1 yellow brass turnings	6.50
No. 1 red brass or composition turnings	7.75
Lead, heavy	7.50
Lead, tea	6.00
Zinc	4.00
Cast aluminum	17.00
Sheet aluminum	17.00